ENGINEERING NEWS-RECORD

MAR. 27, 1958

PRICE 50 CENTS

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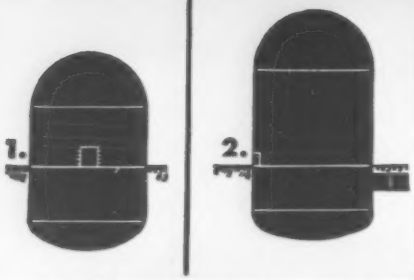
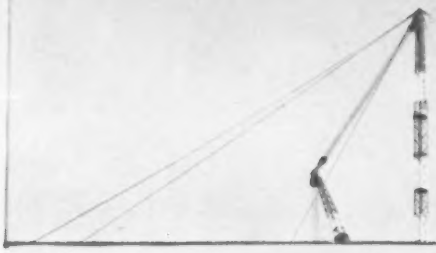
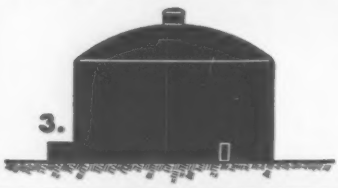
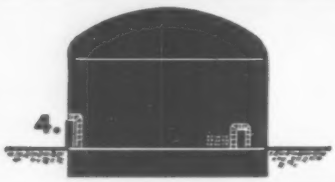


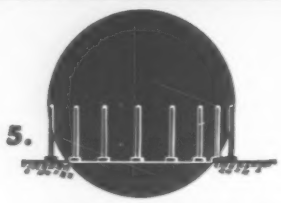


LAST PLATES GO IN AT DRESDEN STATION. 100-ton derrick with 170-foot mast lowers plates into place from 210-foot towers as 190-foot diameter Hortonsphere® nears completion at Dresden, Illinois Nuclear Power Station. CB&I-built structure will house atomic reactor. Station is a General Electric Co. project.

SHAPES OF things to come in the atomic age







CB&I Structures to Silhouette Major Reactor Projects

For CB&I engineers, fabricators and erection specialists, the challenge of things to come in the atomic age is, to a large extent, a reflection of existing accomplishments.

In 1954 the world's largest sphere, a Hortonsphere® measuring 225 feet in diameter, was built by CB&I for the AEC Knoll Atomic Power Laboratory at West Milton, New York, for testing a prototype of the atomic power plant which now serves our atom sub fleet.

Today, near Chicago, a skilled CB&I crew is completing the erection of a 190-foot diameter Hortonsphere to house an atomic reactor for the Dresden Nuclear Power Station. Near Detroit, another CB&I crew erected a reactor containment vessel of a different design for the Enrico Fermi Atomic Power Plant. Silhouettes of similar structures, being designed, fabricated or erected by CB&I, are shown here.

Yes, for CB&I, the shape of things to come in an atomic tomorrow had their beginnings *yesterday*. Experience gained in almost 70 years of furnishing *craftsmanship in steel* to serve Industry, Government and scientific research is now meeting the exacting requirements for reactor containment vessels.

E53C8R

1. Enrico Fermi Atomic Power Plant, Lagoona Beach, Michigan. (Power Reactor Development Co., Architect-Engineers)
2. U. S. Air Force, Dayton, Ohio
3. Atomic Energy Commission, Livermore, California. (Foster Wheeler Corp., Engineers)
4. Massachusetts Institute of Technology, Cambridge, Massachusetts. (John W. Cowper, Purchaser)
5. Dresden Nuclear Power Station, Dresden, Illinois. (Bechtel Corp., Constructor-Contractor)

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REPRESENTATIVES AND LICENSEES:
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Two men carry this 14-ft, 18-in. diam Beth-Cu-Loy pipe which weighs only 214 lb.

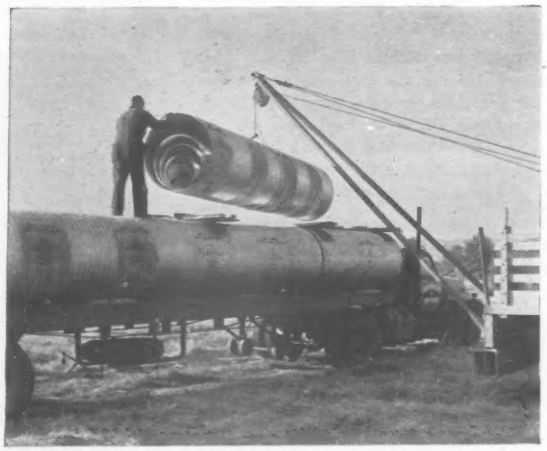
Advantages of light-weight Beth-Cu-Loy culverts

Galvanized Beth-Cu-Loy culvert sheets, being made of steel, have great strength in proportion to weight. This strength is substantially increased by corrugation. That's why it's possible for a Beth-Cu-Loy culvert to have both thin walls and plenty of rugged strength.

Because of these thin walls, a pipe or culvert made of Beth-Cu-Loy sheets weighs considerably less per foot than other types of drainage structures. It is easier to handle, cheaper to ship, can be lifted, unloaded and laid with ordinary roadbuilding equipment. Long pipe lengths are feasible, reducing the number of field joints.

Light weight is a big reason for the growing popularity of corrugated Beth-Cu-Loy culvert sheets for drainage pipe. There are other advantages, too: flexibility, minimum trenching, easy coupling, speedy installation and long service life.

Bethlehem manufactures these sheets for use by fabricators of culverts and drainage pipe. If you would like the names of those who can supply pipe made from Beth-Cu-Loy sheets, just call the nearest Bethlehem office.



Beth-Cu-Loy pipe of varying diameters can be nested for shipping, greatly reducing haulage costs per foot.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

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STEEL-SHEET

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We'll deliver your complete piling needs immediately, *anywhere* in the country, from our nationwide warehouse and field stocks—"Faster-from-Foster".

For help in ordering, write or call the Foster office nearest you for free Piling Wall Chart No. EP-3.

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CERTIFIED
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REPORT

TerraTrac plowed through mud to place full loads directly on scaffolds. Equipped with rubber pads to shield the steel tracks, it also delivered materials through corridors of partially completed building without damaging subfloors.

One month delay SAVED on this job!

To speed construction of the $1,200,000 Muskego Union High School last spring, Oliver Construction Co., Oconomowoc, Wis., general contractor purchased a *crawler-mounted* Case® TerraTrac® M-3 fork lift, equipped with 14'3" mast and interchangeable dozer blade.

And *lucky* they did! For spring thaws and rain turned the heavy clay terrain into a sticky gumbo that *stopped everything on wheels.* But the sure-footed TerraTrac, with its extra-high belly-clearance and power-turn steering, plowed through knee-deep mud, to keep materials moving. Says president Oliver Wierdsma, *"We would have lost a full month and couldn't possibly have completed our contract on time, if we hadn't had this TerraTrac."*

Saved $1,100 per week

All told, the one-man operated crawler fork lift handled some 30,000 blocks and more than 100,000 face brick, *plus* all mortar, tile, stone, lintels, steel beams, girders and roofing. It also erected and dismantled scaffolding, and (with dozer blade) was used for grading, backfilling, cutting sidewalks and driveways. Wierdsma figures it *would have taken a dozen tenders (at $2.30 per hour) to keep pace with the TerraTrac — in handling materials alone!*

Bob Lechnir, M-3 operator adds, "This is one of the easiest-operating machines I've ever run. No job is too tough for it — I'm constantly amazed at its power, weight-moving and lifting capacities."

Investigate today

Don't let mud and snow shut-down YOUR jobs. Keep materials moving, men working and costs down — with an *all-weather* Case TerraTrac M-3 fork lift. See your Case dealer, or write today for full details on new Case financing and LEASE plans designed to help you get new equipment NOW, with easy monthly payments to fit your budget.

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CT-M-128

INDUSTRIAL WHEEL AND CRAWLER TRACTORS • LOADERS • DOZERS • BACKHOES • FORK LIFTS • ENGINES

MACOMBER V-BEAM and STEEL DECK in classrooms illustrate structurally sound, yet attractive appearance. Macomber V-GIRDERS were used for longer spans.

In addition to V-BEAMS, MACOMBER "nailable" LOAD-BEARING PARTITIONS were supplied for use in corridors of offices, classrooms and dormitories.

MACOMBER V-BEAMS

gave Malone College a stronger structure at lower cost!

6 new buildings completed in 240 working days

Macomber V-BEAMS and V-GIRDERS meant substantial benefits to Malone College and to the builder. The exclusive Macomber cold-formed chords and webs, besides providing extra structural strength, contributed an appearance factor that saved ceiling finishing costs and made lower ceiling heights possible without detracting from the pleasing architectural effect.

Macomber V-BEAMS are available for spans to 48 feet, V-GIRDERS to 96 feet. Quality control? — It's *continuous* at Macomber — by Pittsburgh Testing Laboratory resident inspectors.

Write for this Macomber V-BEAM Catalog containing loading tables, chord dimensions and designs, anchoring and bridging information. A new catalog on V-GIRDERS is also available.

MACOMBER

CANTON 1, OHIO

NAILABLE V-BEAMS | V-LOK STEEL FRAMING | METAL DECK AND SIDING | V-BOWSTRING TRUSSES | V-GIRDERS STEEL JOISTS

For letter-perfect concrete

Certainly you can make concrete *without* WRDA and DAREX AEA. But since something of your professional reputation gets poured into every yard you produce, WRDA *and* AEA provide very inexpensive insurance that your good name never will grow less.

Add air to the mix with DAREX AEA and millions of lubricating air bubbles become permanently imbedded in the finished concrete. Controlled air makes the concrete frost-resistant and a whale of a lot more durable. DAREX AEA introduces and controls it.

Reduce water with WRDA and you get a fatter, more uniform mix, with cement particles evenly dispersed and catalyzed throughout. Don't be at all surprised to find compressive strength going up as much as *25 per cent*. WRDA makes concrete pour better too.

Take our words for it: WRDA and DAREX AEA. Together they mean letter-perfect concrete.

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ABILITY . . .

6 reasons why Cast Iron Pipe is #1 choice of U.S.A.

1. **HIGH FLOW CAPACITY . . .**
   Cement lined cast iron pipe and fittings will not tuberculate . . . delivers a full flow for the life of the pipe.
2. **LONG LIFE . . .**
   42 North American cities are still using cast iron water mains laid 100 years and more ago. Hundreds more have passed the 50 year mark.
3. **BEAM STRENGTH . . .**
   Cast Iron Pipe is inherently tough . . . stands up under heavy traffic load, soil displacement and disturbance.
4. **EXTERNAL LOAD RESISTANCE . . .**
   6" Class 150 Pipe withstands a crushing load of 17,900 pounds per foot . . . nearly 9 tons.
5. **CORROSION RESISTANCE . . .**
   Cast Iron Pipe effectively resists corrosion . . . vital factor in its long life and dependability.
6. **TIGHT JOINTS . . .**
   A full range of leak-proof, low cost, easy-to-assemble joints for pipe and fittings are available for all conditions.

THE MAN WHO CHOOSES CAST IRON PIPE TODAY WON'T PAY FOR IT AGAIN TOMORROW!

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MODERNIZED **cast iron**

NOT PROBABILITY!

Cast Iron Pipe's record of maintaining high flow capacity throughout its long life is FACT not FICTION!

Carrying capacity without strength is like running a rickety car with a powerful engine . . . sooner or later it will shake apart.

Why choose between high flow, strength and long life when cast iron pipe gives you *all* of them?

Specify America's #1 pipe and your water system will serve long after the bond issue is retired.

*Here is the proof!

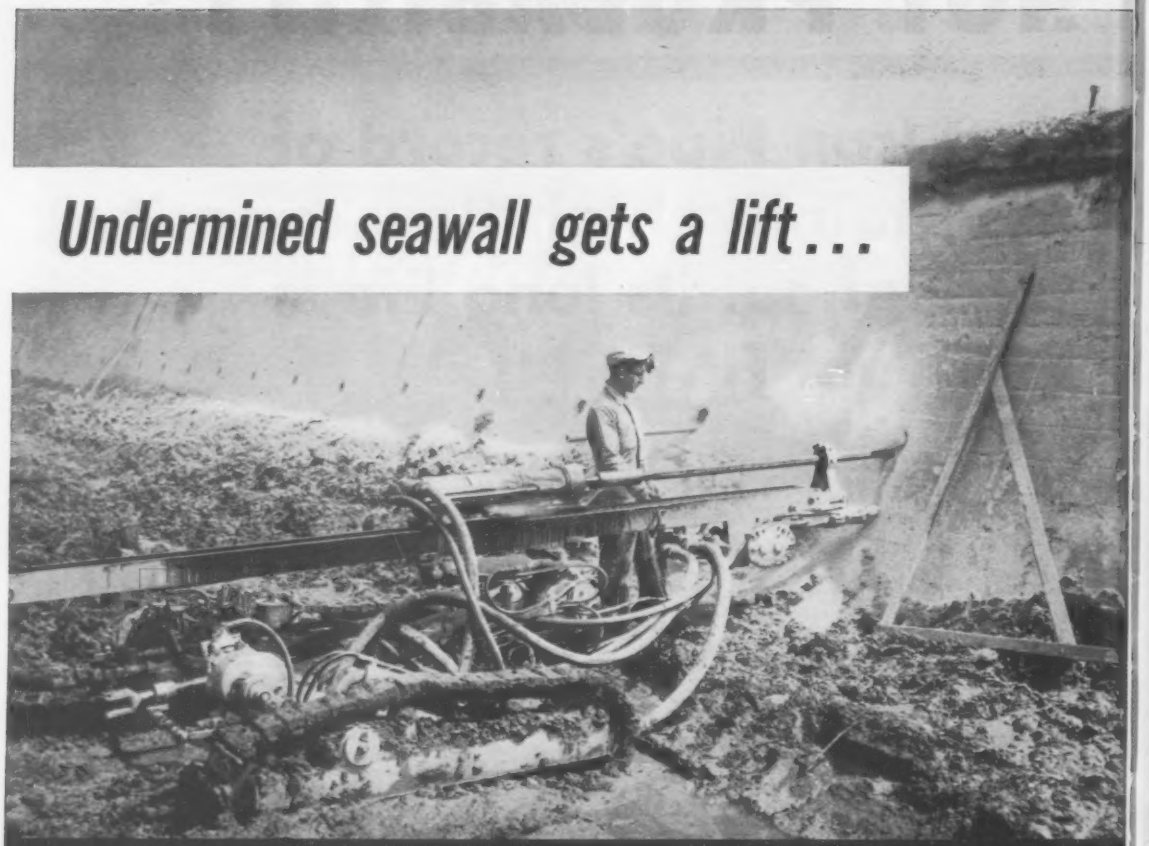
FLOW FACTORS FOR CEMENT LINED CAST IRON PIPE

LOCATION	SIZE	TEST SECT. IN FEET	VELOCITY F.P.S.	AGE YEARS	W & H "C" FACTOR
Bowling Green, Ohio	20"	45,592	0.7-2.4	New	142.5
Chicago, Illinois	36"	7,200	2.6-3.6	New	147
New Orleans, La.	12"	39,650	1.2-2.9	New	141
Corder, Mo.	8"	21,350	0.9-2.3	New	143
Univ. of Illinois	8"	400	3.14	New	150
Concord, New Hamp.	14"	500	1.7-2.2	New	151
Concord, New Hamp.	12"	500	2.0-3.4	11	142
West Palm Beach, Fla.	12"	500	3.6-5.4	15	139.5
Greenville, S. C.	30"	87,376	2.4-2.7	12	148.5
Corpus Christi, Tex.	30"	65,641	1.1-1.8	6	146
Summerville, S. C.	8"	500	1.98-2.43	13	142.5
Champaign, Illinois	16"	3,920	3.1-5.6	22	139.3

*Available upon request: Booklet containing flow test and tables on Cast Iron Pipe.

pipe FOR MODERN WATER WORKS

J. Kennon Perrin Co. was awarded the contract for a major seawall overhaul in Richmond, Va. Old seawall undermined by James River will be supported by steel rods anchored in a new wall being built behind it. An INA performance bond stands back of the job.



Undermined seawall gets a lift...

bonded economically with INA's extra value

Contracts are obtained with bids which take advantage of every saving in cost.

The contractor on this seawall job provided a performance bond with INA as surety to take advantage of INA's well-known extra value.

The coverage was worked out by an INA independent agent, taking advantage of minimum rates.*

Prompt handling, tremendous resources and broad experience in bonding are extra values which count heavily when you get down to the fine points. It may pay you to call your nearest INA agent before working up your next bid. He's as cost-conscious as you are.

*Sorry, not available in Louisiana and Texas

INSURANCE BY NORTH AMERICA

INDEMNITY INSURANCE COMPANY OF NORTH AMERICA

One set of spare parts serves all these 18 HERCULES engines

Here's parts interchangeability to warm a maintenance man's heart! Hercules designed the new DD diesel and GO gasoline engines with the user in mind: succeeded in achieving a unique degree of interchangeability that reduces spare parts requirements for Hercules-powered equipment to a minimum.

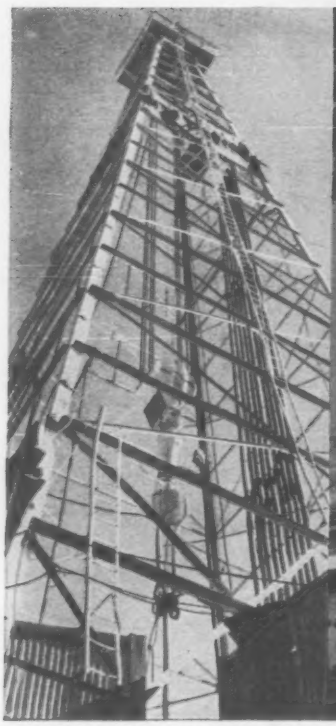
Actually, the illustration above doesn't tell the whole story. To do that, we'd have to show 6 power units as well as all 18 models of 3, 4, and 6-cylinder engines available in the DD and GO series—a total of 24 power plants using many of the same wearing parts!

You can take advantage of this maintenance economy by specifying Hercules diesel, gasoline, or LP-gas power for the equipment you buy. If you'd like the full story on these modern engines, write Hercules Motors Corp., Canton 2, Ohio—or call your Hercules distributor: there's one in the Hercules worldwide network near you.

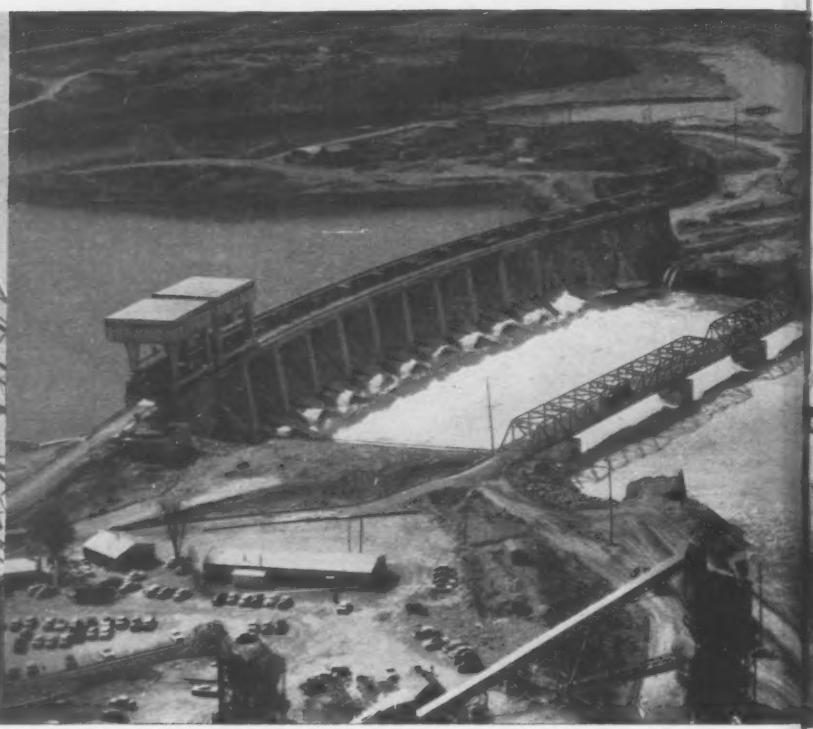
HERCULES

HERCULES MOTORS CORPORATION
Canton, Ohio

5 great American rope tricks . . .



TO CHANGE A MAN'S MIND. Tiger Brand Wire Rope Drilling Line lasted nearly twice as long as the driller of this rotary rig expected. This is typical Tiger Brand performance in the oil fields.



TO SPEED A SEAWAY. Here, at Long Sault Dam, and at most other projects on the St. Lawrence Seaway, Tiger Brand Wire Rope and its ability to take hard, grueling, continuous punishment played a vital part in construction. In fact, wire rope was so important that American Steel & Wire set up a special warehouse at Massena, New York, just to serve the Seaway contractors. Tiger Brand Wire Rope helped speed dredging, materials handling, form setting and concrete pouring.

THE PICTURES BELOW show just five of the thousands of tricks that USS Tiger Brand Wire Rope is performing today.

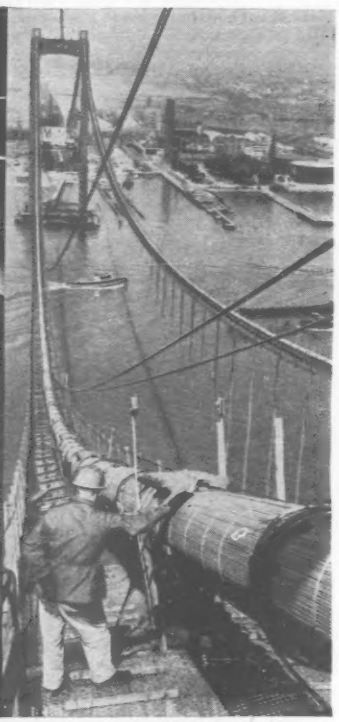
You also will find it on elevators that speed office workers safely up and down modern skyscrapers. You will find it protecting the lives of motorists on high-speed superhighways. You will find it scooping shrimp off the ocean bottom . . . carrying steel from the open hearth to the mold . . . dredging rivers . . . snaking logs through the timber forest.

Everyday, every one of us meets Tiger Brand Wire Rope and benefits. It helps us to build . . . it helps us to move . . . it helps to keep us safe. There is no industry in America that does not depend, in some important way, on the strength and quality of Tiger Brand Wire Rope.

For fast delivery of Tiger Brand Wire Rope, call our distributor near you. American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

O MOVE A MOUNTAIN. uipped with strong, durable ger Brand Wire Rope, this nt power shovel can handle 0,000 tons of material daily. ng rope service is vital.

TO HARASS A HURRICANE. Thirty sturdy Tiger Brand Wire Rope guy lines brace this TV tower against winds of 155 mph. The tallest tower in Texas, it serves stations WFAA-TV and KRLD-TV . . . is 1,521 feet high . . . required 38,682 feet of Tiger Brand Wire Rope.



TO SUPPORT TRAFFIC. Two million vehicles a year will use the history-making Mackinac Bridge in upper Michigan. Its safety depends on Tiger Brand Wire Rope and Bridge Wire—enough to go almost twice around the world.

American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel • Tennessee Coal & Iron • United States Steel Export Company, Distributors abroad

Hamilton's pace-setting styling is catching on...fast

Hamilton Auto-Shift tables
Hamilton's design leadership is reflected in the modern office-look of the all-new Auto-Shift tables. This *new-look* concept combines modern styling with Auto-Shift's traditional space and time saving benefits.

Hamilton L-Shaped tables
Every draftsman and engineer will appreciate the personalized work-area design of the all-new "L" tables *plus* unlimited board flexibility, convenient reference space and maximum storage capacity.

More new ideas coming
See Hamilton's newest pace-setting innovations at the Design Engineering Show, April 14-17. New ideas—in styling, in design, in craftsmanship—that create a workplace where a man can do his self-satisfying best.

DESIGN ENGINEERING SHOW

BOOTH NO. 622

April 14-17, Chicago International Amphitheatre

DRAFTING EQUIPMENT
DESIGNED AND CRAFTED BY

Hamilton

HAMILTON MANUFACTURING COMPANY • TWO RIVERS, WISCONSIN

Reader Comment

Franki Straightens Record

SIR—Your Feb. 13 report from Rio de Janeiro (p. 44) captioned "11 Story Building Turns Over" tells how "Frank Pile Co." evidently meant to identify our South American affiliate, Estacas Franki Limitada—was called in at the last minute and worked with a 40 man crew around the clock for two days in an unsuccessful effort to save the structure. Anybody familiar at first hand with soil conditions in that city would realize that this was an almost impossible task, especially since construction had been started in 1955 and the building had been known to be settling for almost two years.

However, since the report also states that one engineer gives the cause of the collapse as "either the piles were too short or they were improperly constructed" and no mention is made of the name of the foundation contractor, it might be assumed that Franki also installed the original piles, which is definitely incorrect.

To set the record straight, we would like to state in brief the facts as recently furnished to us by Estacas Franki.

Estacas Franki did not install the foundations of the Sao Luiz Rei Building.

On Monday, Jan. 27, the owners asked Estacas Franki to attempt to stabilize the Sao Luiz Rei Building. Franki agreed to try but without giving any guarantee and without assuming any responsibility in view of the dangerous condition of the building.

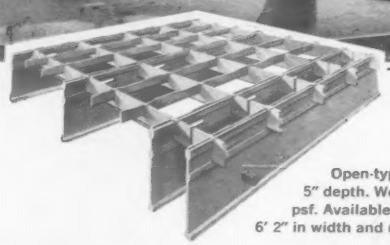
On Tuesday Estacas Franki took settlement readings and started preparatory work. The firm immediately informed the owners that the building appeared to be lost but that they would continue work in the hope that enough time remained to install a few piles to slow down the rate of settlement. Settlement in 24 hr was 2 to 3 mm.

On Wednesday Franki continued preparatory work while the tilting of the building continued. Settlement in 24 hr was again 2 to 3 mm.

On Thursday the installation of the first two Mega underpinning piles had not yet been completed when the set-

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Reflooring with AMBRIDGE I-BEAM-LOK gives old bridge new lease on life... lifts ban on big trucks



Open-type I-Beam-Lok 5" depth. Weighs 18.8 lbs. psf. Available in units up to 6' 2" in width and up to 49' long.

When the Keokuk Bridge Commission of Keokuk, Iowa, authorized the reflooring of the *repeatedly resurfaced* old timber floor on the bridge across the Mississippi River, their action resulted in far-reaching benefits. For not only did the new open I-Beam-Lok flooring provide a permanent all-weather floor that will *save a considerable amount in upkeep and snow removal,* but also, because it was lighter and stronger than the old floor, it was possible to lift the 10-ton weight limit which had long kept big trucks off this bridge.

Reflooring the 3,152-ft.-long x 18-ft.-wide bridge required approximately 59,000 sq. ft. of 5" TR-type open I-Beam-Lok.

While there is no way to determine accurately the weight of the old floor, built up with layer upon layer of various materials over the years, it seems certain that the weight saved in reflooring was at least three or four times the weight of the I-Beam-Lok itself—18.8 lbs. psf, or 567 tons in all. I-Beam-Lok, being steel, also greatly increased strength, literally giving the old bridge a new lease on life.

For information about the time- and money-saving advantages of this modern lightweight bridge flooring, ask for a copy of our 32-page catalog.

Keokuk Municipal Bridge
Keokuk Bridge Commission, Keokuk, Iowa

Designed by Modjeski and Masters, Harrisburg, Pa.

Contractors: The Whiting-Turner Contracting Company
Baltimore, Maryland

USS

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.
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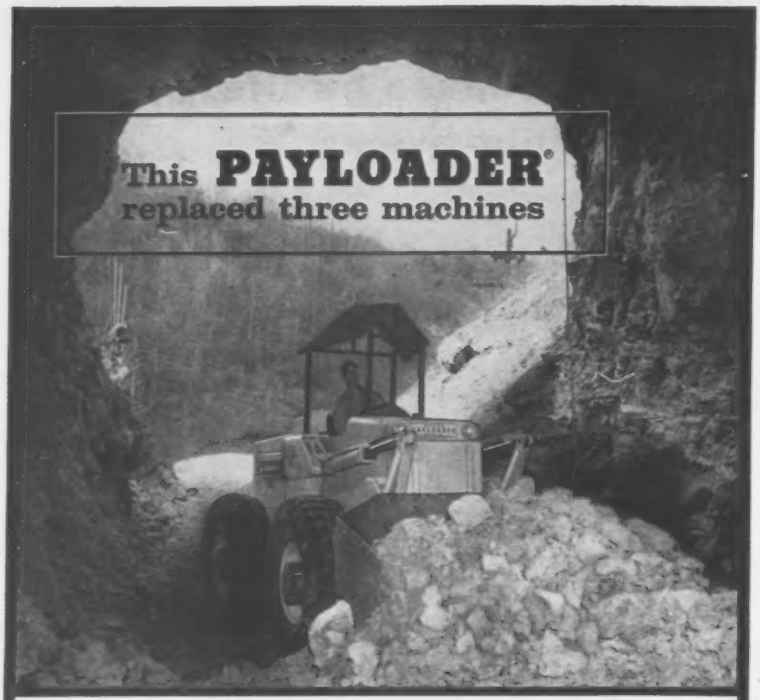
USS AMBRIDGE I-BEAM-LOK BRIDGE FLOORING

UNITED STATES STEEL



To enlarge the bore of three 70 year old tunnels for the Norfolk and Western Railway, Contractor Ralph E. Mills Co., Inc., switched to this Model HO "PAYLOADER" tractor-shovel to remove the blasted rock after each shot. This job was previously handled by an overhead loader and two off-road shuttle trucks.

Mills' Superintendent, George E. Steele, sums up the performance of the "PAYLOADER" . . . "the result in a saving of ½ the equipment cost and two operators, also less fuel and maintenance." He adds, "After a shot today, the HO loaded out and carried thirty-four 2-yd. loads to the spoil area in 40 minutes — a 150 foot one-way haul distance. On this type of tunnel excavation where maximum haul distance does not exceed 500 feet, I prefer the HO 'PAYLOADER' over any machine I ever used."

The power, traction, speed and versatility of a 4-wheel-drive "PAYLOADER" can be used to boost output and profit many ways on your jobs also. Contact your Hough Distributor for full information.

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Send full PAYLOADER® data on
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tlement increased sharply and reached 2.5 mm in 15 min. At that time, 6:45 p.m., Franki withdrew its personnel and part of its equipment. At 7:55 p.m. the building collapsed.

The building owners and the radio, press and television reporters have been unanimous in acknowledging the unselfish efforts of the Franki Company and the courage of its personnel.

The chief engineer of Estacas Franki is reported in the Rio de Janeiro newspaper O Dia as stating that his company in the last several months has saved at least five other major structures from a similar fate. In these instances the responsible parties asked for technical assistanec from Franki in sufficient time to permit corrective measures to be taken, and as a result these buildings are safe.

George E. Hayes
President
Franki Foundation Co.
New York, N .Y.

Two "Longest" Bridges?

Referring to your issue of February 13, 1958:

On page 62 (in an advertisement) is a picture of the World's longest suspension span—Golden Gate Bridge. On page 161 (in an editorial feature) is a picture of the World's longest suspension bridge—Mackinac Bridge.

Pray tell, which is rightly entitled to it?

Howard F. Clark
Chino Basin Municipal Water District
Cucamonga, California

Editor's Note: Both structures are entitled to the credit given them in the texts. Mackinac Straits Bridge is the world's longest suspension bridge—8,614 ft from anchorage to anchorage, as compared to 6,450 ft for the Golden Gate Bridge. However, Mackinac's 3,800 ft center suspension span is exceeded by the 4,200 ft main span of the Golden Gate Bridge.

CALENDAR

American Congress on Surveying & Mapping, 18th annual meeting, Shoreham Hotel, Washington, D. C., Mar. 23-26; in conjunction with **American Society of Photogrammetry,** 24th annual meeting, Mar. 20-29.

American Wood Preservers' Association, 54th annual convention, Statler-Hilton Hotel, Los Angeles, Calif., April 14-16.

American Institute of Steel Construction, annual national engineering conference, Chase-Park Plaza Hotel, St. Louis, Mo., April 17-18.

Southern Municipal and Industrial Waste Conference, 7th annual meeting Duke University, Durham, N. C. May 1-2.

Purdue Industrial Waste Conference, 13th annual meeting, Purdue Memorial Union Building, Lafayette, Ind., May 5-7.

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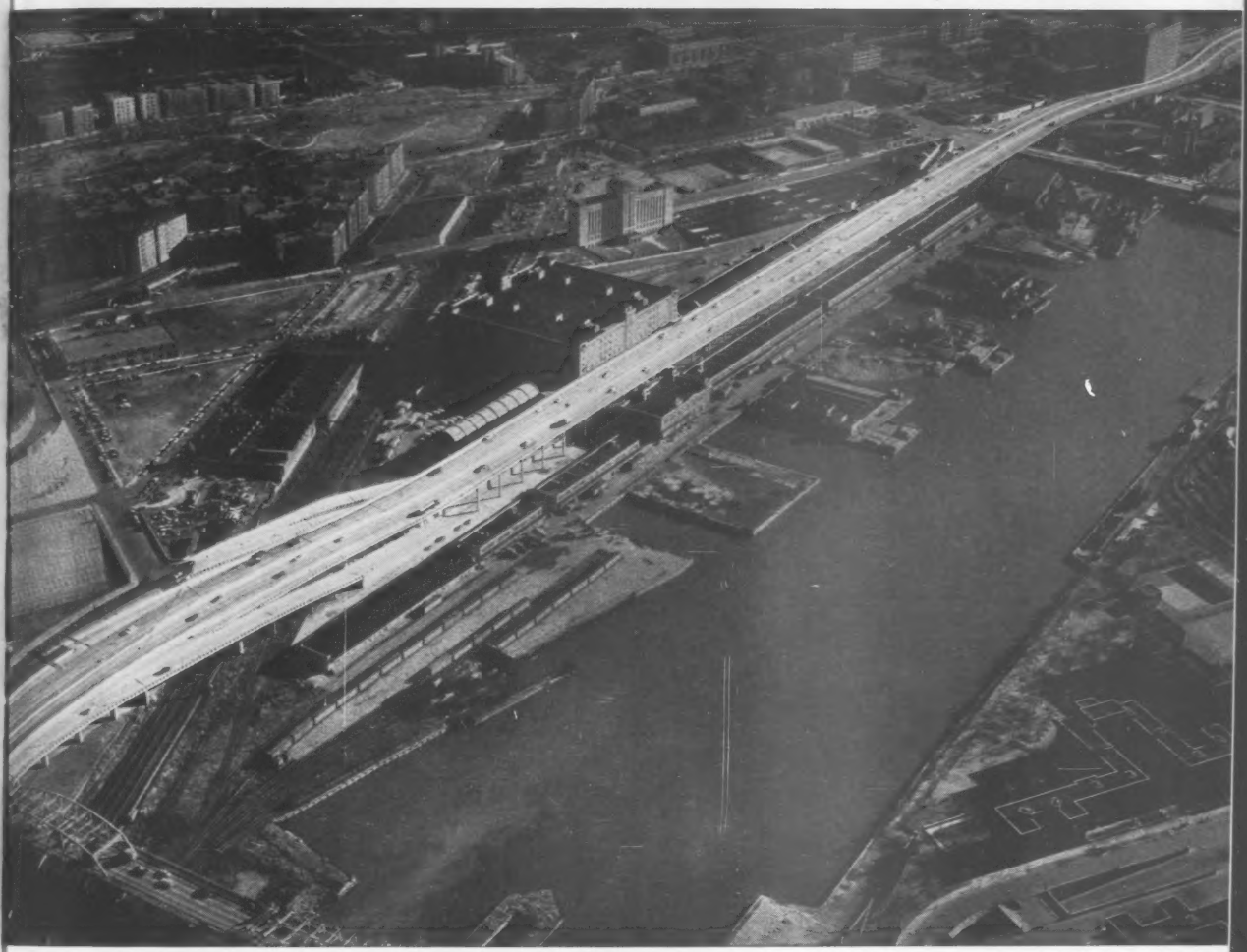

Installing 11,194 Raymond Cast-in-Place Piles for this important artery between Yonkers and Manhattan is just one example of our part in improving motoring facilities from coast to coast. Other projects recently completed include foundations for 93 bridges, overpasses and allied structures for the new Illinois Toll Road System and the 24 mile long Lake Pontchartrain Causeway in New Orleans, Louisiana.

Big jobs? True, but we also take pride in fulfilling small, even one-project contracts as well. So whether you are planning a whole new super highway, a single culvert, bridge, or overpass . . . any highway structure which requires a foundation, investigate the advantages and economy of employing our more than 60 years' experience in the field. Send for our new Highway Brochure which gives a detailed resume of how Raymond can help you and the National Highway Program. Just write Dept. E-5. Or contact your nearest Raymond office and we'll be glad to discuss your foundation projects.

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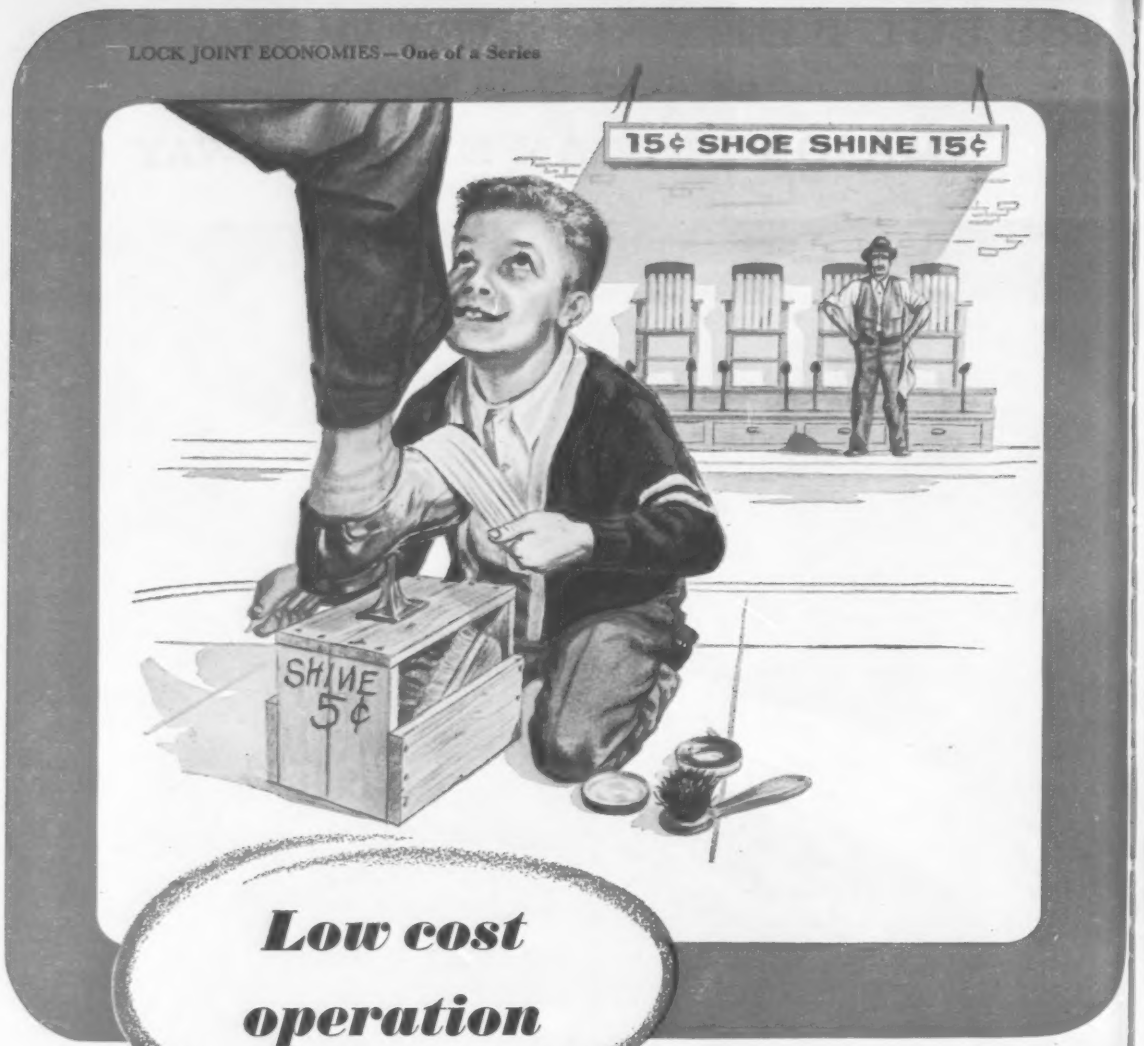

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Whether it be shining shoes, or a multi-million dollar industry, operational costs can spell the difference between success and failure. That is why so many government agencies, municipalities, private water companies, and industries have turned to LOCK JOINT CONCRETE PRESSURE PIPE.

The dense walls of Lock Joint Concrete Pressure Pipe resist electrolysis and soil corrosion. They also protect steel reinforcing of such conservative stress design that danger of bursting is virtually negligible. Result: replacement or even repair is a rarity, and danger of sudden failure which often entails extensive damage is held to a minimum.

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THE CONSTRUCTION WEEK

FEDERAL AID FOR WATER SUPPLY PROJECTS?—Representative Clair Engle of California last week introduced a bill before Congress that would provide federal reimbursement for flood control, navigation and fish and wildlife benefits associated with municipal and industrial water supply projects constructed by local governmental and private agencies. Noting that the major undeveloped water projects in California will be mainly for municipal and industrial water supply, Congressman Engle said that no provision exists in present federal law for the development of these types of water projects.

AND WITHOUT PAUL REVERE—The embattled farmers of Concord Bridge would be proud of their modern counterparts at Cibola Span between Arizona and California. The westerners who built the unauthorized 410 ft structure across the Colorado River (ENR Aug. 8, 1957, p. 29) have apparently won a victory over the Army—and five other government agencies—in their fight to keep it. The existence of the bridge came as a surprise to authorities last year—particularly to the Army Engineers who said that it could not be built for anything near its actual cost and that site conditions made erection improbable. Now the Army is willing to accept a construction application with the provision that the existing bridge gets a 20 ft wide span clearing high water by at least 10 ft.

LET'S TAKE THE GREEN ROAD—The driver of the future may pick his route according to his wife's color preference if tests soon to be run in Pennsylvania prove successful. The State Department of Highways has announced that it will construct (probably near Harrisburg) a short experimental stretch of plastic pavement. The test materials will be clear, but the coloring possibilities of plastics have led one highway official to suggest that red, yellow or green pavements could be used to inform drivers of approaching road conditions.

CONTRACTOR WINS STRIKE DAMAGES—Morrison-Knudsen Co., Inc., of Boise, Idaho, has been awarded $140,000 damages by a federal court in Spokane, Wash., for losses suffered when two unions struck the firm's $1,869,580 construction job at Hanford Works during the spring of 1956. Court had previously ruled that Local 839 of the teamsters and Local 370 of the operating engineers unions had breached labor agreements with the company when they struck, among other things, for free bus transportation within the project. Damages, which are based on 17 different items, are described by the court as compensatory and not punitive.

AMERICAN BRIDGE uses truck cranes on Mackinac Bridge construction

P&H

Construction of the Mackinac Bridge called for accurate crane work in extremely close quarters. For the job the American Bridge Division of United States Steel used two, highly maneuverable, 35-ton P&H "555" truck cranes. They laid the bridge flooring with precision and speed to assist in meeting the November 1st opening date.

HERE IS WHY P&H SATISFIES USERS:

- P&H planetary boom hoist lowers the boom under power for real precision work.
- Boom motions are smoother and faster with P&H hydraulic controls.
- P&H larger brakes give better braking action.
- P&H live roller circle provides faster swings.

Skilled operators get more work out of the 555A-TC than from any other machine in the 35-ton class. It delivers more production on every job for higher earning power. That's why when owners and operators get together, they agree on P&H.

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

ENGINEE

WASHINGTON OBSERVER

- **BPR report to show costs under estimates**
- **Democrats seek end to lease-purchase**
- **GSA plans to keep letting contracts**
- **Westerners push for more de-salting plants**
- **Military contracting starts up**

● **Actual cost of the nation's multi-billion-dollar highway program ran around 9% below state estimates in 1957.** That is what a Bureau of Public Roads report due out within the next few weeks is reported to show.

The soon to be released figures compare bid prices and engineering estimates, and they deal only with interstate and primary roads. They will show the cost difference—actual vs. estimated—by size of construction job. Some states reportedly went over estimated prices, others below. It varied with the volume of work in progress. Nationwide, however, the bidding was below estimated costs.

● **A showdown is coming again over the lease-purchase method of building an estimated $700 million worth of government buildings.** The Democrats want to shut the program off at the end of June. Thereafter, they would have the buildings financed through direct appropriations—the way government buildings were built before the Eisenhower Administration came up with lease-purchase as a way to get the buildings at a lower annual impact on the federal budget.

The Democrats cite figures to show that under lease-purchase it costs $1.64 to pay for what can be bought for $1 under regular appropriations. The difference is made up, they say, of the interest on the borrowed money and local taxes over the period during which the government is paying off the annual chunk of principal.

● **The House Appropriations Committee struck at lease-purchase by voting some $177 million in direct appropriations for the construction of 66 buildings** for the year beginning next July 1. The committee estimated the cost to the taxpayer of these buildings via lease-purchase at $384 million.

Regardless of all this, General Services Administration is going ahead with advertising for bids and awarding contracts on buildings that are in the lease-purchase processing pipeline. The lease-purchase record thus stands like this: one building finished, six under construction, and 29 to be placed under contract by the end of June.

● **A $10 million federal program for building large-scale saline water conversion plants** has been launched by a bloc of western congressmen. But they're still arguing among themselves whether to get behind a few really commercial-sized plants, or a larger number of pilot-plant facilities.

New Mexico's Sen. Clinton Anderson and California's Rep. Clair Engle are charging that the Administration has failed to place enough "urgency" behind the program. California water officials warn that the state will need distilled sea water by 1962-65 to meet its needs.

● **New military contracting is moving up,** but the climb is far short of a rate necessary to get the government's projected $2 billion out in new building contracts during the 1958 fiscal year.

The government put out $85 million in new contracts in January. Over twice the amount obligated for military construction last January. Early estimates are that February and March figures will show a continuing move from the doldrums of the last half of calendar 1957.

US RUBBER CONVEYOR BELTS

Higher speeds, greater loads, longer life —with fewer belt plies!

The unusual thing about this self-propelled loader is the fact that it is equipped with a *4-ply* belt which is turning out a more satisfactory performance than the *5-ply* belt it replaced. This 4-ply belt is a U. S. Rubber Giant® (style EN), 54' long, and is doing such a good job that the operator is very well satisfied with its excellent performance.

The service is rugged—handling sand and gravel at speeds up to 700 fpm over small pulleys, under severe weather conditions, sun and ozone.

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Construction has a big stake as . . .

1. A housing bill goes to the President

2. A make-haste highway bill is argued

3. A public works booster shot is aimed

Congress Battles an Economic Downturn

Two weeks ago the Administration and both sides of the aisle of Congress hauled anti-recession artillery to the battle line. Last week, Congress fired the first gun—a housing bill. Now the battery crew is aiming its second weapon—a highway bill—and close behind it is a multi-billion-dollar public works bill.

1. Housing

The House, by an overwhelming voice vote, sent a $1.85 billion emergency housing bill on the way to the White House after the Senate—only seven days earlier—unanimously approved the same legislation.

Only quick-acting measures that will boost housing immediately are included. A second housing bill to come later will take care of urban renewal, loans to colleges, public housing and all the usual annual authorizations and technical improvements for other housing programs.

The measure cleared both houses without any significant change (ENR March 13, p. 114). It is the same Sparkman bill that the Senate Banking Committee reported only three weeks ago.

This fast action perhaps is symbolic of what could happen to the rest of the anti-recession measures sponsored by the Democratic leadership. Housing was No. 1 on their list, to be followed immediately by Senator Gore's highway bill (see p. 22) and other measures such as Senator Fullbright's proposal to advance $2 billion of federal funds to local governments for ready-to-go public works projects.

Despite Administration opposition to the money provisions and other homebuilding aids in the Sparkman housing bill, the President has no politically practicable choice but to sign it. With Republicans in Congress supporting the housing bill and other anti-slump measures as vigorously as the Democrats, there is no hope that President Eisenhower could get a ⅓ vote in either house to sustain a veto.

The two biggest homebuilding generators in the Sparkman bill are the $1.85 billion of federal funds for the home mortgage pool and a two-year extension of the World War II veterans' home loan program, otherwise destined to die this summer. Along with this extension, the bill continues direct loans to veterane outside metropolitan areas until July 25, 1960 and gives the program $300 million for these mortgage loans.

Other features of the bill open the door to increased private financing of home construction. One of the keys to the door will boost the permissible interest rates from 4.5% to 4.75% for for GI home loans and from 4% to 4.5% for mortgages on Capehart military housing projects (see table p. 22).

Home buyers, too, get a break under the bill. To make purchasing easier for the family with limited resources, down payments on FHA-financed houses are cut substantially, as shown for the representative $15,000 home in the table (page 22). The Sparkman measure eases the down payment by requiring only 3% on the first $13,500 of property value, instead of $10,000 at present. Above the new 3% bracket, requirements remain as now: 15% of the next increment up to $16,000 and 30% of the excess above $16,000 up to $20,000.

The measure limits use of $1 billion of the new money for the purchase of FHA and VA mortgages up to $13,500—on new houses only—by the Federal National Mortgage Assn. (Fannie Mae). Similarly, the legislation lifts the ceiling on direct loans to veterans from $10,000 to $13,500. These provisions run along with the easing of FHA down payments, to be 3% up to the same figure of $13,500.

This is how the new federal housing funds are to be allocated and used:

All the Fannie Mae mortgage-purchase money—$1 billion directly to the agency and another $500 million to the President for Fannie Mae's use at his discretion—consists entirely of federal funds to be supplied by the Treasury. This money, plus $25 million for military housing and $25 million for homes of essential civilians at research centers of the services, comes under Fannie Mae's special assistance category, and is separate from its secondary market operation that buys mortgages up to $15,000 from private lenders.

Money for the latter program, not covered in the present bill, comes 10% from the Treasury and 90% from sale of Fannie Mae debentures on the private market. By contrast, the new Fannie Mae funds—totaling $1.05 billion for immediate agency use plus $500 million more as needed via the President's reserve—put no drain on private sources. The entire total comes out of the federal government's general funds, leaving private money resources undepleted for other financing.

Money to finance the two-year direct loan program of the Veterans Administration at the rate of $150 million a year likewise will be drawn from the federal Treasury. This has been the practice for direct loans since Congress set up the program in 1950.

Huge additional funds for Fannie Mae mortgage buying will have a dual effect in stimulating the making of new home loans. First, the mere presence of the big new backstop for mortgage lenders will encourage lending institutions to accept more mortgage commitments, particularly for principal amounts up to $13,500. Second, the greatly increased resources of Fannie Mae assure ample funds for purchase of mortgages from lenders who need money to finance new loans.

This will be true for $15,000 mortgages as well as for those in the $13,500 category.

Sellers of loans within the $13,500 ceiling will naturally apply for "special assistance purchase" by Fannie Mae from its new $1 billion funds. The spe-

. . . Congress battles economic downturn

cial assistance operation buys FHA and VA mortgages at par at a cost of only 1.5% in fees. The seller gets 98.5% of the face value. But sellers to the secondary market fund must take a discount under par on their offerings, put 2% of the money received into Fannie Mae common stock and pay a 0.5% fee.

President Eisenhower's new special assistance fund of $500 million can be used by Fannie Mae in whatever way the President sees fit, for the general purchase of FHA and VA mortgages. In other words, he can order these funds or any part of them to be employed for purchase at par of mortgages exceeding $13,500 if he thinks the market requires such action.

Changing Terms

Downpayment requirements for FHA-insured home mortgages and those backed by the VA have been on the move since the introduction of both programs. Table below shows the course of cash requirements for each of the programs since their introduction to the present.

Effective Date	Minimum Down Payment on $15,000 House
FHA-Insured Loans	
Nov. 27, 1934	$3,000
July 18, 1950	3,800
Oct. 12, 1950 (Korean Regul. X)	4,300
Sept 4, 1951	4,200
June 11, 1952	3,700
Sept. 16, 1952	3,000
Aug. 2, 1854 (Post-Regul. X)	2,000
July 30, 1955	2,300
March 29, 1957	2,000
Aug. 5, 1957	1,050
New bill	650
VA-Guaranteed Loans	
Oct. 18. 1944	None
Oct. 12, 1950 (Korean Regul. X)	$3,550
Sept. 14, 1951	3,450
June 11, 1952	2,550
Oct. 2. 1952	750
April 23, 1953 (End of Regul. X)	None
July 30, 1955	300
New bill	300 (no change)

Effective Date	Maximum Mortgage
VA Direct Loans	
July 19, 1950	$10,000
New bill permits	13,500

Maximum allowable interest rates for FHA and VA home mortgages also fluctuated as shown below.

	Maximum Interest Rate on Home Mortgages
FHA:	
Nov. 27, 1934	5%
Aug. 1, 1939	4½
April 20, 1950	4¼
May 2, 1953	4½
Dec. 4, 1956	5
Aug. 5, 1957	5¼
Legal FHA maximum has been 6% from the start.	
VA:	
GI law effective Oct. 18, 1944	4%
May 5, 1953	4½
New bill	4¾

Effective Date	Interest Rate
VA Direct Loans	
July 19, 1950	4%
May 5, 1953	4½
New bill permits	4¾

MILITARY HOUSING:

Capehart housing law effective Aug. 15, 1955 (successor to Wherry Housing) set maximum rate at 4%. New housing bill raises to 4½ %.

2. Highways

Congress also is on its way to pushing through a major highway measure designed to offset the economic downturn. The Senate this week was passing a highway bill that would inject between $600 million and $715 million into the economic bloodstream during fiscal 1959.

As a pump-primer, the bill adds $400 million to the $875 million authorized for ABC roads for fiscal 1959 in the Highway Act of 1956. This would be apportioned on a formula that would give $180 million to primary roads, $120 million to secondary roads, and $100 million to urban connections and interchanges. Instead of the usual 50-50 matching basis for ABC roads, the bill provides that the federal share be 70% against 30% for the states. Further, the measure provides that an additional $115 million be authorized for the Secretary of Commerce to advance to states unable to come up with their share of the matching funds this year. However, any funds advanced to the states for matching the additional 1959 grants, will be deducted from their share of the 1960 and 1961 funds.

The bill also amends the Highway Act of 1956 by increasing the amount for the 41,000 mile interstate system by $200 million for fiscal 1959 and by $300 million each for fiscal 1960 and 1961.

The bill also provides for the regular biennial authorization for ABC roads for $900 million each for fiscal 1960 and 1961. This is $25 million over the $875 million approved for fiscal 1959 for ABC roads in the Highway Act of 1956.

The Senate bill (S. 3414), sponsored by Sen. Albert Gore (Tenn.) and some 16 other Democrats, would knock out the Byrd amendment from the 1956 act which limits expenditures on interstate and ABC roads to the amount received into the highway trust fund that year from federal oil and gasoline taxes. If this committee action stands, it would mean that should outgo exceed income during the next three years, the highway trust fund will be able to draw on the general fund to make up the deficit.

The most controversial section in the Senate bill restricts the use of billboards along the interstate system. And the same is true for reimbursements to states for money paid out to utilities for the cost of relocating facilities along rights-of-way of the interstate system. The Senate committee cut the top amount of federal reimbursement from 90% to 70% of total cost. The Administration opposes any repayment whatever.

3. Public Works

Both Congress and the White House are taking big steps to make heavier outlays for public works the basic anti-recession strategy.

There are still plenty of disagreements about details, but the Administration and the lawmakers are moving in the same general direction.

Biggest program to be added to the Democratic list recently is a bill by Sen. J. William Fulbright (Ark.) to make $2 billion available as public works loans to state and local governments. This would be an increase from $100 million which now exists as lending authority of the Community Facilities Branch of the Housing and Home Finance Agency.

The Fulbright bill also lowers the interest rate and increases the types of projects on which loans could be advanced. The loans would be made for streets, sewers, waterworks and the like.

Other public works increases are still being sought for long-standing programs.

The Administration asked for $46 million for hospital construction. Key Democrats are ready to push for a $174 million increase.

Some $63 million per year is being asked by the Administration for airport construction; Democrats want to raise this to $100 million per year for five years, plus $75 million in additional cash right away.

President Eisenhower joined the rush to public works with an order to Housing Administrator Albert Cole and Agriculture Secretary Ezra T. Benson to do their best to speed up the spending of $2.2 billion worth of construction.

Of this, $75 million is for public works for small towns and represents money newly released by the Budget Bureau. The rest of the $2.2 billion represents sums already approved by Congress and in some cases actually assigned to the project. What President Eisenhower wants is quicker action in getting the money spent.

Rural electrification projects totaling $750 million are part of the $2.2 billion package.

The balance of the sum—$1.4 billion—is for college housing, public housing, slum clearance, and public facility loans supervised by Mr. Cole.

Atom Circus

Three-ring meeting stars technical and managerial problems plus equipment

Engineers in construction, especially those dealing in sanitation and structures, must play increasingly responsible roles in the fast-moving nuclear energy field, speakers at the 1958 Nuclear Congress in Chicago said last week.

An estimated 10,000 scientists and engineers attended the 1958 Nuclear Congress, which included: the 4th Nuclear Engineering and Science Conference sponsored by 30 engineering and scientific societies and coordinated by Engineers Joint Council; the Atomic Energy Management Conference; and a big show of manufacturers' wares.

• **Sanitary**—At the congress, it was predicted that waste disposal will not be a significant obstacle to achieving competitive nuclear power. Nonetheless, the problem of handling radioactive wastes is formidable, as was illustrated by a description of facilities designed for the 180,000 kw Dresden Station near Chicago.

Design requirements dictated that radioisotopic concentrations discharged into the Illinois River must be less than 10% of the maximum permissible concentrations established by the AEC. There must be no uncontrolled discharge of radioactivity to the ground, and consequently, to the water table. Wastes at Dresden will be stored until the radioactivity decreases to a safe point, then diluted and discharged; long-time radioactive wastes will be concentrated and buried permanently. All waste-handling operations will be by remote control from a central location.

• **Concrete shields**—The congress was told that if atomic power is to become competitive, more efficient use must be made of concrete and other materials in constructing thermal shields. In designing shields exposed to high thermal conditions, special care must be taken to provide sufficient reinforcing steel to prevent excessive cracking or spalling of the concrete. In some cases steel liners, aluminum heat reflectors, or special refractory materials are needed to reduce the heat load being conducted to the concrete shield.

Structural engineers were told a considerable amount of money could be saved by more realistic designs of large pressure vessels used to contain lethal substances from nuclear reactors in the event of accident. A number of them are partly embedded in soil, yet very little is done to reduce the thickness of the buried portion.

U.S. Gives Airports $63 Million

The largest annual allocation of federal funds under the Federal Airport Program has been made—$63.5 million for the fiscal year 1959. The money, which must be matched by state or territorial funds, will be spread among 341 airports in the U.S. and 17 in Alaska, Puerto Rico, and Hawaii.

The allocation is the last one to be made under the four year program authorized by Congress. States with the greatest number of projects are California and Michigan with 26 each, Illinois with 19 and Pennsylvania with 18.

Almost half ($31 million) of the federal money will go to the 40 airports listed below:

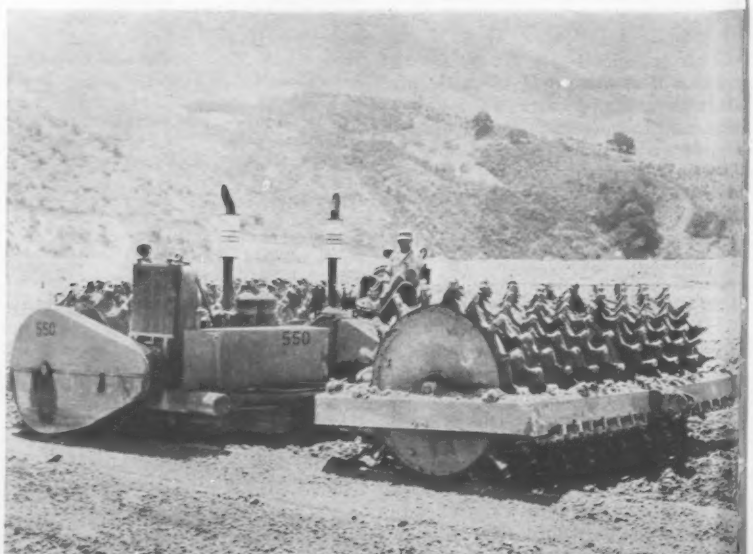
City	Airport	Federal Allocation	Purpose of Funds
Birmingham, Ala.	Municipal	$900,000	Acquire land & construct terminal bldg.
Phoenix, Ariz.	Sky Harbor	513,304	Enlarge terminal bldg. & parking apron
Los Angeles, Calif.	International	1,000,000	Pave taxiways & aprons
Oakland, Calif.	International	1,000,000	Construct terminal bldg.
San Diego, Calif.	Lindbergh	900,000	Construct terminal bldg. & apron
San Francisco, Calif.	International	1,000,000	Pave extension of runway, taxiway & apron
San Jose, Calif.	Municipal	526,890	Acquire land
Miami, Fla.	International	1,000,000	Acquire land, extend runway & taxiway
Atlanta, Ga.	Municipal	1,000,000	Construct terminal bldg. & concourses
Chicago, Ill.	International	1,000,000	Construct runway
Covington, Ky.	Greater Cincinnati	500,000	Preparation for runway & taxiway
Louisville, Ky.	Standiford	685,000	Construct terminal bldg. addition & taxiway
New Orleans, La.	Moisant Intl.	1,000,000	Construct terminal bldg. & apron
Boston, Mass.	Logan Int'l.	775,000	Construct maintenance bldg. & apron
Detroit, Mich.	Wayne County	1,000,000	Acquire land, construct taxiway & runway
Minneapolis, Minn.	International	990,000	Construct terminal bldg. addition
Rochester, Minn.	Municipal	642,000	Construct terminal bldg. & runways
Jackson, Miss.	Municipal	607,750	Prepare & pave runway & taxiway
Kansas City, Mo.	International	537,500	Pave runway & taxiway; construct ramp
St. Louis, Mo.	Municipal	846,000	Construct & reconstruct runway, taxiway
Omaha, Neb.	Municipal	600,000	Acquire land, construct apron & taxiway
Albany, N. Y.	Municipal	750,000	Construct terminal bldg., apron & roads
New York, N. Y.	International	1,000,000	Relocate runways & taxiway
Syracuse, N. Y.	Clarence E. Hancock	650,000	Construct terminal bldg.
Asheville, N. C.	Municipal	513,642	Construct terminal bldg. & pave runway
Akron, Ohio	Akron-Canton	511,000	Construct terminal bldg.
Columbus, Ohio	Port Columbus	750,000	Construct runways
Dayton, Ohio	James M. Cox	900,000	Pave apron, taxiways, road & parking area
Oklahoma City, Okla.	Will Rogers	800,000	Acquire land, extend runway & taxiways
Tulsa, Okla.	Municipal	800,000	Construct terminal bldg. & apron
Portland, Ore.	International	900,000	Acquire land, construct runway & taxiway
Philadelphia, Pa.	International	1,000,000	Enlarge terminal bldg.
Pittsburgh, Pa.	Municipal	1,000,000	Prepare site for runway
Nashville, Tenn.	Berry	650,000	Prepare & pave taxiway & apron
Corpus Christi, Tex.	Municipal	834,188	Construct terminal bldg. & control tower
Houston, Tex.	International	1,000,000	Expand terminal bldg. & construct apron
San Antonio, Tex.	International	525,600	Expand terminal bldg. & apron
Milwaukee, Wis.	Gen'l. Mitchell	900,000	Extend Runway & construct taxiway
Honolulu, Hawaii	International	750,000	Construct terminal bldg.
San Jaun, P. R.	International	950,000	Addition to cargo bldg. & extend runways.

Lake Breaks Highway Fill; Larger Lake Nearly Follows

A highway fill, which had been reworked less than a year ago to double as a low dam, gave way at an overflow spillway March 15 to flood a large residential area of Bennettsville, S. C. And as the 75 acre state-owned lake drained through the breached double-duty dam, cutting the highway, a dike (right side of photo) separating it from a larger, 300 acre body of water set aside for fishing, came perilously close to breaking. National Guardsmen and state and county forces brought in sandbags and managed to strengthen the partially gone dike dividing the lakes. Repair of the dam, reportedly weakened during a seige of wet weather, may have to await final settlement of liability claims before work can be started. It was contractor-constructed under supervision of the State Highway Department.

Big Compactor Is Self-Propelled

This self-propelled four-drum sheepsfoot fill compactor was developed by Mittry Constructors of Los Angeles for use on Vaquero Dam near Santa Maria. According to an official of the firm, the machine is doing as much work as three ordinary tractor-drawn compactors. Powered by two 200 hp diesel engines, the unit weighs 50 tons, moves at eight mph, and by itself is compacting the fill placed by 22 18-cu-yd earthmovers. In 1954 the inventive Mittry outfit developed the "Mole," a tunneling machine used for large bores on Oahe Dam near Pierre, S. D.



High Strength Steel for Bridge

This 118 ton steel end post, along with three vertical members for the portals, will support 8,500 tons of fabricated steel going into the Fort Pitt Bridge, which will cross the Monongahela River from Pittsburgh's Golden Triangle. Richardson, Gordon and Associates, consulting engineers, specified this steel because of its desirable properties—such as high yield point. Designers came up with a double deck, tied-arch structure—an unusual design believed the first to use a truss as a tie—because of its aesthetics and its ability to span the entire width of the river and meet navigation requirements. Four lanes of one-way traffic will flow in each direction on two separate levels. U.S. Steel's American Bridge Division fabricated the high-strength component at its Ambridge plant.

Pipeline Inspector's Joy

No more stooping or crawling for inspectors of the 100 mile water pipeline between Stuttgart and Sipplingen, Germany. A three-wheeled vehicle developed to make inspection easier and faster is propelled with a bicycle-type mechanism by the man at rear while the workman in front steers and inspects the pipe.

Bank Gets Glass Block Wall

Glass blocks of mixed sizes and patterns form the second-floor wall of the Richfield State Bank in suburban Minneapolis, Minn. The finished glass wall cost $2.80 per sq ft. Interior prisms in the hermetically sealed blocks diffuse light evenly throughout the building working area; a blue-green diffusing screen reduces brightness and heat gain. Adolfson and Peterson were the contractors. Louis Boynton Bersback was the architect.

Golden Anniversary

Concrete pipe group sees bright times ahead

The American Concrete Pipe Association took a searching look at past technical progress and charted a course for the future at its 50th annual convention in New Orleans, March 12-15.

A perspective view of the past was gained from an all-day session of the technical problems committee, and an interesting book titled, "50th Anniversary History of the American Concrete Pipe Association," was prepared for the occasion. As to concrete pipe's future, ACPA Managing Director Howard F. Peckworth told delegates that business should continue at a high level, even during the current recession period, provided the industry continues its excellent research program. Areas requiring improvement are method of jointing, special sections and special exit and entrance structures.

"Ours is now the accepted commodity for sewer and drainage lines and culverts," said Mr. Peckworth, at the same time warning of increased competition in small pipe sizes from clay pipe and in large sizes from corrugated metal pipe. He noted recent Bureau of Public Roads criteria that allow concrete pipe to be used in sizes up to 108 in. dia under as much as 100 ft of fill.

Leading papers presented at the convention included a report on hydraulic energy losses at joints in concrete pipelines by Lorenz G. Straub of the University of Minnesota and St. Anthony Falls hydraulic laboratory; a detailed insight into how hydrogen sulfide forms in sanitary sewer lines by Richard D. Pomeroy, consultant of Pasadena, Calif.; and a comparison of the performance of concrete and corrugated metal drainage pipe installed beneath runways at Hunter Air Force Base in Savannah, Ga., by Harvey Heyward, Charleston, S. C., consultant. Not surprisingly, ACPA discussors saw concrete pipe standing up "remarkably well" over its competitor.

Also on occasion of its 50th anniversary meeting, the ACPA prepared two other new books, "The Hydraulics of Culverts" by John G. Hendrickson and a revised edition of "Concrete Pipe Handbook" written by Mr. Peckworth.

New ACPA president is Eugene F. Bespalow, chief engineer of Choctaw, Inc., Memphis, Tenn., succeeding Carl A. Bluedorn, Waterloo, Ia.

Two-Acre Roof Collapses in Mexico City

The steel and concrete roof of a year-old Mexico City folding-paper-box factory caved in suddenly March 17, killing two persons and injuring 190. The cause of the collapse is not known.

The fallen section covered the entire 86,000 sq ft production area, about 80% of the one-story building. Office and warehouse areas were not affected.

Owned by Envases Aztlan, a subsidiary of W. R. Grace Co., of New York, the structure consisted of concrete-covered metal decking and light steel framing supported by concrete block walls and reinforced concrete columns, some of which came down also. It will cost about $200,000 to rebuild, according to William Upson, factory director.

The crash occurred in about 40 seconds. A preliminary guess on the cause is that vibrations of heavy machinery were too much for the structure.

State authorities and the insurance company are investigating the crash, and in addition, Grace is hiring independent experts from both Mexico and the U.S.

Big Sewerage Plan

$147 million of projects needed in Cleveland area

A half-million-dollar engineering report on Greater Cleveland's waste and storm water disposal problems was released last month. It recommends that a central countywide agency construct $147 million worth of trunk sewers and treatment plants over the next 40 years. In the first five years, about $67 million would be spent.

The plan is based on the assumption that all 58 cities and villages in Cuyahoga County (including Cleveland) will be completely urbanized in the early future, with present population of 1.6 million jumping to about 2.2 million.

The recommended central agency would finance the various types of improvements by different methods, although it would design and construct the entire program, which is limited to aspects that are regional in character. Communities having their own systems would continue operating them and continue to construct branch sewers.

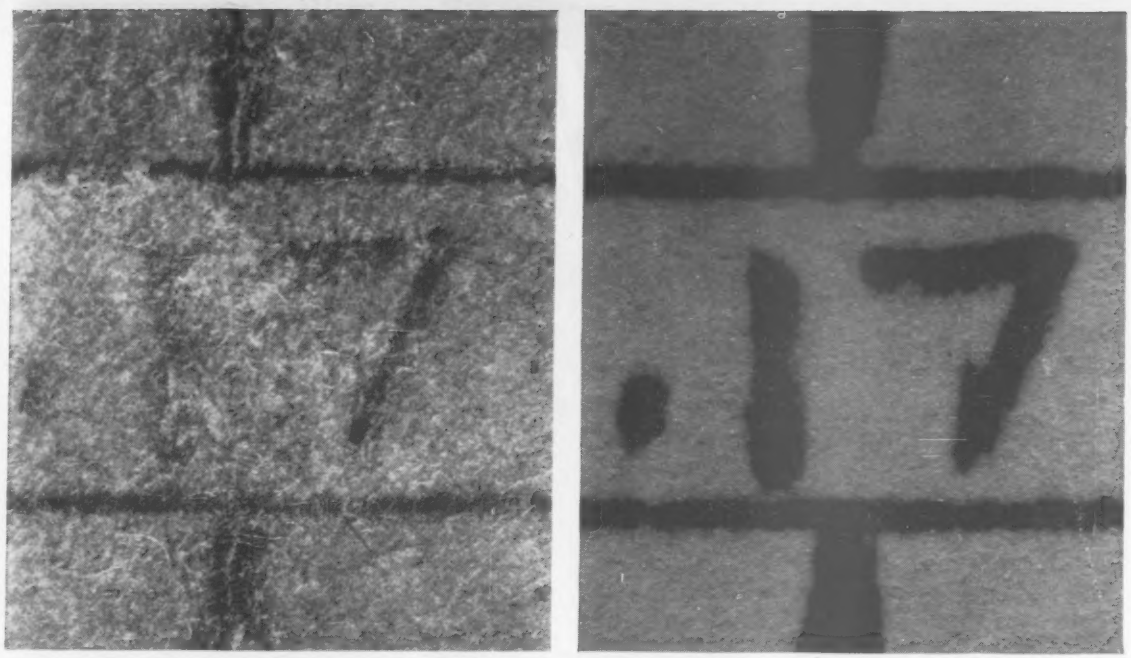
Interceptor sewers would be financed 90% by a 20 year tax assessment on the area and 10% by sewer rentals. Treatment plants, 22 new ones and 10 expanded facilities, would be financed by 40 year revenue bonds. Storm sewers would be financed by countywide taxes.

The $500,000 report, six years in the making, was requested by the Cleveland Regional Plan Commission. A number of engineering firms participated, with the report compiled by Albright & Friel, Inc., Philadelphia.

State Would Build Dam With Industry's Help

Backed by financial commitments from private industry, the New Hampshire State Water Resources Board will make application for a Federal Power Commission license to build an $11 million water supply dam. The proposed dam, High Errol, would raise the level of Lake Umbagog on the Androscoggin River 28 ft and store 460,000 acre-ft of water to be used primarily by industry.

The project would be built by the state board, a governmental agency established in 1935. Financing would be by a bond issue to be amortized over a 50 year period through annual contributions made by the principal users of water in the Androscoggin River. Brown Co., a pulp and paper maker, would pay 27% of the cost. Other contributors would be Public Service Co. of New Hampshire, Union Water Power Co., Central Maine Power Co., Rumford Falls Power Co., Oxford Paper Co., Dartmouth College and International Paper Co.



These photomicrographs show effects of identical handling on (l.) a pencil drawing and (r.) an Autopositive Paper intermediate made from same drawing

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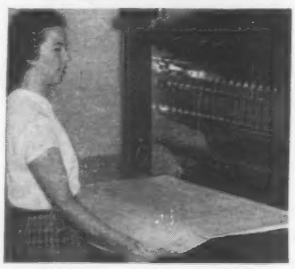

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—Briefs—

• **Wolf in sheep's clothing**—Congressman John A. Blatnik, author of the construction grants program in the 1956 Federal Water Pollution Control Act, recently described the Potomac River as "the best dressed cesspool in the country." Mr. Blatnik was citing areas in need of his controversial grants program. The February "Newsletter" of the Interstate Commission on the Potomac River Basin noted the Congressman's eloquence and did not dispute his characterization of the river.

• **Lots of street work**—Milwaukee plans to spend about $75 million in the next six years for improvement of some 160 miles of its major streets. In addition, it expects to lay out nearly $34 million for construction of non-arterial streets.

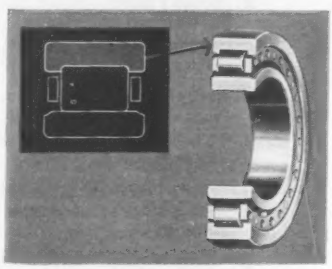
• **Relocation**—The Tennessee State Highway Department will appeal a chancery court decision upholding a 1957 legislative act requiring it to pay for relocation of utilities on the interstate highway network. Under the law, the state must pay for relocation on the interstate system, but not on the primary and secondary roads systems except in "hardship" cases. It is estimated that relocation costs would amount to about $15 million.

• **Narragansett Bay tunnel**—Hopes for construction of a two-mile tunnel under Narragansett Bay in Rhode Island have been revived in the light of a report that Newport city officials were told that increased traffic potential in the area would make a toll tunnel commercially feasible. The tunnel would go from Newport to the Conanicut Island, and earlier estimates put the cost at $30.8 million.

• **Damaged bridge**—The three-mile long bridge carrying U.S. Highway 158 across Currituck Sound, N. C., was damaged by floating ice jams during February's freezing weather. About 270 ft of the bridge have been affected, and at one place outside and center piles had broken, causing the bridge to tilt four feet at that spot. Emergency repairs have been made and the bridge is open to limited traffic, but permanent repairs await better weather.

• **Toll-free bridge**—The Delaware River Joint Toll Bridge Commission expects to advertise soon for bids for a $6.4 million toll-free bridge across the Delaware River near Yardley, Pa. The bridge will be a high-level span and have four traffic lanes. Half the cost is to be borne by the federal government and the remainder shared by Pennsylvania and New Jersey.

Loggers' "weight-lifter" tests bearing stamina!



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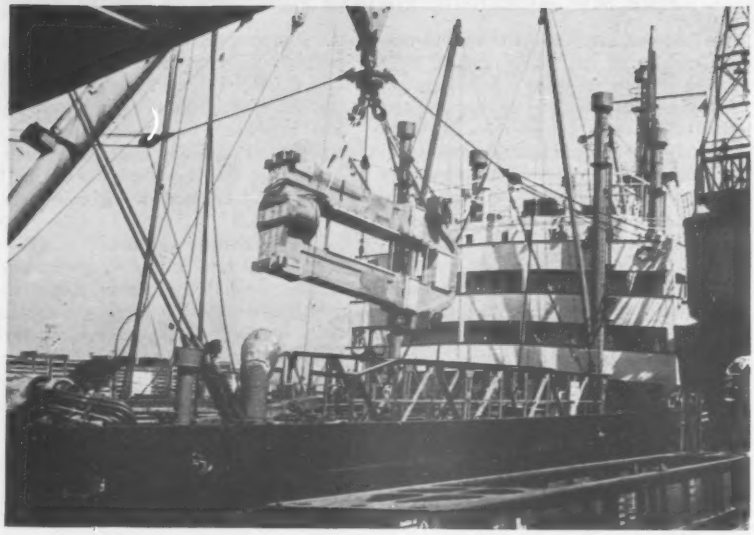


Beating the Odds When Building Abroad

Each time a contracting or engineering firm obtains a construction job within the U. S. or its territories, terrain, weather, material availability and transportation—combined or singly—can, of course, upset the best of planning. But when the job is in a foreign country, not only are these risks still present and multiplied, but such additional troubles as different manners and morals, and even revolutions must be mastered. ENR asked a number of firms experienced in foreign work how they have managed to overcome some of these problems. Their answers follow:

• **Investigation a key**—There is no certain method by which pitfalls can be avoided, but before bidding on, or accepting a foreign project, a firm must send one or more top men to the area to investigate the natural hazards of the job site including its accessibility.

In addition, through conventional news sources, by personal experience, by contacts, or special surveys of the area, the company must have a sound knowledge of the sociological, political, economic, and religious backgrounds of the country in which it intends to work. A lack of such current information could at best be costly or at worst be ruinous.

Where any one or all of the non-project factors appear subject to sudden, unexpected upheaval, perhaps the safest course open to a company is the cost-plus-fixed fee contract. This type of agreement admittedly limits the profits derived from the project, but it also provides a larger measure of protection against loss.

Take the case of a construction firm working in Haiti under a lump sum contract.

Last December, when the company's project was within a few weeks of completion, a political blowup occurred and several changes took place within the government.

Labor groups, taking advantage of the upheavals, bore down on the contractor with money demands that included payment of wages to workers who had long since left the payroll. To fulfill the terms of his contract with the client, the contractor agreed to the demands, which therefore had to come out of his profit pocket. Had the job been taken on a cost-plus-fixed-fee basis, the unexpected added cost would have been borne by the client.

However, there is another route to profit safety when the company feels that political instability may interfere with the normal progress of a job—a clause in the contract allowing renegotiation of payment if the project is bogged down by circumstances beyond the control of the contractor.

• **Bigger stakes**—Not for the faint of heart, but for those with confidence in their own ability and in the country they plan to work, is the contract that sets a target price. At the opposite end of the contractual pole of maximum safety, an agreement of this type will call for a bonus for beating the target and a penalty for going over the target date and price.

But the final decision on the type of agreement hinges on the conditions, practice and laws of the particular country in which the construction or engineering company intends to work.

Among the top problems of working abroad are personnel costs in addition to wages. These include, for both native and U. S. workers, living allowances, maternity benefits, termination and retirement pay, vacation pay and compensation for accidents occurring both on the job and off the job. In some Latin American countries, these benefits may equal 70% to 100% of the entire payroll.

• **First build a city**—Many times the job itself will dictate living conditions and the accommodations to be provided. In a remote area, housing must be provided for the company's American employees. It also may be required for local workers.

George S. Colley, Jr., senior vice-president of Bechtel Corp., San Francisco, said that a company "may have to provide everything." When that company obtained a contract to build a refinery at Aden for British Petroleum, Bechtel had to construct a city to accommodate 15,000 persons.

But in addition to erecting the structures, it then had to provide many of the services which a city government would ordinarily supply. It established a guard or police system, traffic control and enforcement, and recreational facilities.

The last item is no small problem in itself, because a company does not stop at providing the structures. When a job is a lengthy one in an isolated area, the construction firm then must be prepared to set up a recreation program. And more than one construction firm

. . . Hire few Americans—Make sure they're right

has become involved in show business, at least in its exhibiting aspects, for it must supply a steady and generous assortment of movies for the workers. Sports equipment and recordings also are a must under such circumstances.

When the families of American personnel are brought into an area, there arises the problem of educating the children.

• **Americans in minimum numbers**—Because of these complexities, the number of Americans manning a job in a foreign country is kept at an absolute minimum. If possible, only top supervisory help from the U. S. is employed on the job. The availability and quality of local labor will dictate how large or small the American work force will be.

The use of local labor is not only cheaper in all its aspects, but also it creates a more favorable attitude on the part of the foreign national and local governments. The greater the amount of cooperation from local authorities, the easier and quicker will the project be done.

In underdeveloped areas, American personnel frequently are used to train the local workers in the operation of equipment, and when this has been accomplished they return to this country or move on to another land where workers must be taught.

• **Local subs**—Many companies make it a point to obtain the services of local subcontractors if they are available.

Boris Lochak, chief engineer for Gibbs and Hill, Inc., New York City, said that, "although we do much of our work in Europe, we do not compete with European firms. When we assume overall responsibility for a job, we give as much work as possible to local engineering organizations. By doing this, we are not considered a threat to the local economy, and we get cooperation."

When drawing upon local labor or subcontractors, a company must also be prepared to adapt to local custom. And some of the customs are radical departures from those in the U. S.

In at least one area (India) women have equal rights with men—but not in the manner that would be considered here. They have the right to do materials handling labor.

Kaiser Engineers' John Hallett, who supervised the $135 million steel mill expansion at Jamshedpur said women worked side-by-side with men in the earth hauling phase. In fact, approximately 10% of the entire work force on the job was composed of women.

• **Feed them and save**—Making use of local labor, although generally considered a sound policy, can boomerang if a company makes the mistake of overestimating the productivity of the workers. E. W. Littlefield, executive vice-president of Utah Construction Co., San Francisco, explained that climate and worker physique sometimes make it impossible for the local worker to be as fast and efficient as his counterpart in the U. S.

The physical weakness of workers many times results directly from malnutrition. Several contractors found that productivity can be increased substantially by feeding the work force three times a day. The accompanying boost in production, when the workers' health is improved through a balanced and substantial diet, can far offset the cost of the food.

• **Mind your business**—Feeding the workers three times a day is one of the few ways that a company can interfere with personal habits or practice without incurring trouble. Stepping into local or national politics is a sure way to buy difficulties.

Some practices and beliefs may be annoying and even may be the cause of delaying a job, but to attempt a change or modification will not only be fruitless, but destructive in the long run.

A holiday or fiesta period may appear suddenly, and as a result cut down the labor force sharply. Live with it, say those with experience. Various religions also can complicate work schedules. For example, in Indonesia the Mohammadens take Friday off, the Christians, Sunday. In India, October is almost a complete loss because of the long series of Hindu holidays in that month.

• **Choose Americans carefully**—Because of the delicate problems that can result from violation of what—by U. S. standards—appear as foolish custom, it is basic that a construction or engineering firm screen U. S. workers thoroughly before sending them to overseas job sites.

L. E. Stephenson of Frederick Snare Corp., New York, said that "personal character traits are as important as professional ability in a man who will be working abroad. He must know how to handle himself in all situations, and he should therefore be stable, tactful, tolerant, self reliant and patient."

Mr. Stephenson pointed out that in addition to getting a man over the obstacles of local custom and religion, these same qualities will be required when a project is located in an isolated area. "A lonely area requires a man with a strong, resiliant and adaptable character," he added.

And according to C. W. May of Williams Bros. Co., Tulsa, "picking the wrong man for an overseas job can cost several thousand dollars and, worst of all, he can irreparably damage working relations in the community."

To further insure a smooth-working operation when U. S. personnel arrive at an overseas job, many firms have orientation programs that cover the history, customs, economy and attitudes of the country and its people.

• **Watch the supply line**—The best trained men, however, will be helpless unless they have topnotch lines of communication and supply supporting them. A competent planning, procurement and expediting organization in the U. S. is a "must."

To meet the demands of close scheduling and coordination of personnel and equipment in relation to job progress, Kaiser Engineers has a tightly-knit unit working in Oakland, Calif. to speed progress on their Tata Steel mill project.

According to Mr. Hallet, the big trick is getting most of the processing completed before materials reach Calcutta. This is done so thoroughly, that as much as 12,000 tons of material a month are moved through customs in that city.

To accomplish this, Oakland headquarters notifies its expeditors and traffic men in Calcutta as to when the goods are scheduled to arrive. Also forwarded are technical literature and drawings explaining the equipment so that customs officials can more easily and quickly determine duties to be levied.

When the goods arrive, lighters unload the ship in stream, move them to rented port facilities, and then load them on Kaiser-owned rail cars that transport them to Jamshedpur about 150 miles away.

These cars in themselves were a large purchasing operation. Kaiser bought 24 high-capacity units because there were only two cars of the type needed in all of India.

• **Expediting and pilferage**—Getting material clear of dockside and to the job site as fast as possible also offers another advantage in some countries where pilferage may be commonplace. A fast-working, resourceful expediter and local cooperation can be of great value in such areas.

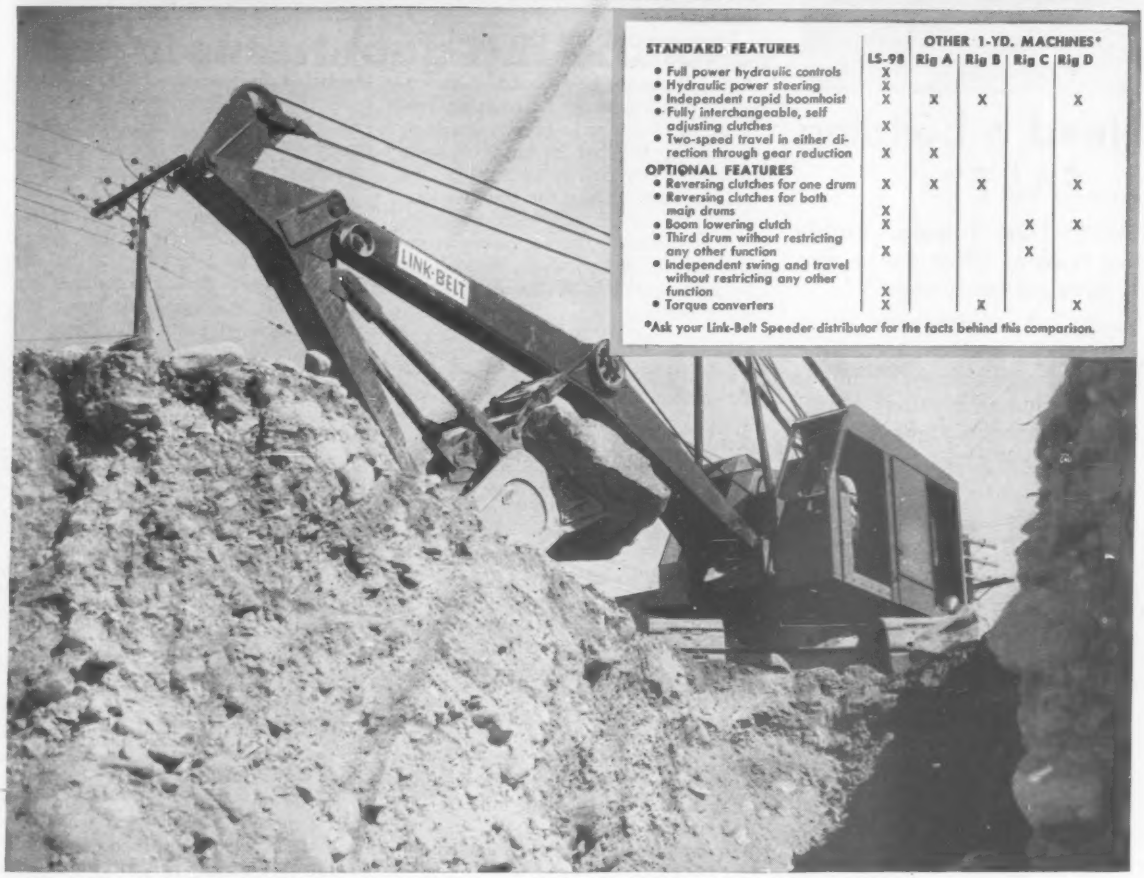
One contractor even had to go a step further because of the high incident of theft. To cut down the loss at dockside and other unloading points, he had to have arriving equipment stowed in welded steel boxes. Even pick-up trucks received this packaging treatment.

Governmental red tape is a factor in stalling material and equipment at the unloading point and also at the job.

There is no sure way to avoid such

Only with Link-Belt Speeder ***Full-Function*** *design . . .*

all these features in one shovel-crane



STANDARD FEATURES	LS-98	OTHER 1-YD. MACHINES* Rig A	Rig B	Rig C	Rig D
• Full power hydraulic controls	X				
• Hydraulic power steering	X				
• Independent rapid boomhoist	X	X	X		X
• Fully interchangeable, self adjusting clutches	X				
• Two-speed travel in either direction through gear reduction	X	X			
OPTIONAL FEATURES					
• Reversing clutches for one drum	X	X	X		X
• Reversing clutches for both main drums	X				
• Boom lowering clutch	X			X	X
• Third drum without restricting any other function	X			X	
• Independent swing and travel without restricting any other function	X				
• Torque converters	X		X		X

*Ask your Link-Belt Speeder distributor for the facts behind this comparison.

Get a profit bonus with these standard features . . . tailor the machine to the job with these optional features

Exclusive with Link-Belt Speeder — revolutionary *Full-Function* design provides a separate power train for each machine function.

That's why you can have and use all these 11 major features on the same machine — without restricting other operations.

Practically double power train life

And that's why *Full-Function* design spreads wear over more clutches, shafts, gears and bearings. Only the power trains in use are under load!

But this is only one of the many Link-Belt Speeder advantages. You also get —

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- **Speed-o-Matic—proven power hydraulic controls**
- **Bonus crane capacity working with long booms at extended radii**

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Need a building ...FAST?

SWISS-LOK Tubular Building Frames offer these exclusive advantages:

Vastly cut erection time, crane service and labor costs
No welding, cutting, riveting or bolting at the site
One-third less weight without strength sacrifice

One crane is sole equipment needed and its time is ⅔ less because of fast SWISS-LOK connections.

Using the patented SWISS-LOK, all structural parts slip together quickly, providing a rigid structure that meets all A.I.S.C. requirements. The SWISS-LOK "keystone" permits wide spans without center columns.

The rigid-type truss chords parallel the roof slope, providing more overhead space for materials movement and storage.

All new, tested pipe is used exclusively in SWISS-LOK structures.

All structural frame members can be hauled by trailer truck, providing fast delivery, convenient spotting and reduction of handling.

SWISS-LOK structural framing is independent of roofing or siding. Any type may be used and standard wall tying and sheet metal fastening are applicable. There is no reliance upon wall or roof construction for support, alignment or rigidity.

SWISS-LOK structures are applicable to any style building — industrial, warehouse, institutional, public or commercial. For descriptive, illustrated literature write:

SWISS FABRICATING, INC.
Office and factory
Camp Horne Road, Pittsburgh 2, Pa.

. . . Good contacts help on overseas projects

partial strangulation. But one of the unpleasant facts of business life in some countries is that of graft. The customs office can be the breeding place for this practice, according to some construction officials.

Most reported that they avoid paying bribes because once the practice is started it cannot be stopped. One engineer said a newcomer to foreign construction occasionally obtains a job by paying for it, "but he then discovers he'll never stop paying for that job. It's like blackmail. Once the grafter knows you'll pay, the demands keeps growing."

A few firms, however, candidly said they regard the payoff as a necessary business expense in the conduct of overseas projects.

• **An influential cousin**—Who you know is important in operating abroad. And if a company has no such connection in its own organization, it is sometimes possible and advisable to retain a person with solid contacts.

One large engineering and construction firm said a local legal counsel, one who has standing in the foreign community, can be a logical solution to some problems of delay.

He reported that the "disadvantage of operating in an unfamiliar country can be offset by retaining a local person who has good contacts and is familiar with procedure."

In this firm's case, one of its expediters is a man with relatives in many of the local government offices. When a problem develops, the expediter is told of it. The standard reply is, "I'll talk to my cousin about it," and the standard result usually is resolving of the problem.

• **On buying American** — What may have been a good slogan in the U. S. a few years ago—"Buy American"—is not always a good one when working on an overseas construction project. One construction executive said "the days of all-American equipment jobs are fast fading. The engineer or contractor who wants to stay ahead must know how to make the best use of European and American equipment, so that both together obtain maximum results."

In any event, the degree of mechanization on a foreign job depends upon the time allotted for completion, ease of moving the equipment to the site, local customs, economics and availability of labor.

Although the Tata mill expansion by Kaiser used American methods to a greater extent than ordinarily would have been employed, there were some major exceptions to the rule.

The company installed 26,000 ft of 36 in. pipe manually. A company spokesman explained that "you can string out a lot of workers along that distance, and manpower is so cheap that it doesn't cost any more than if the operation were mechanized."

• **The trouble with money**—All of the headaches on overseas jobs do not stem from labor, transportation or custom. A large bottle of aspirin should be kept handy for the days when foreign governments talk about money.

One builder said that, in a country in which his firm was working, the government suddenly passed a law requiring that all wages had to be paid in the currency of the country. The payroll for American employees had to be converted from dollars into the domestic currency and then back into dollars. He added that "we lost so much on the exchanges that it would have wiped out our profits if we had been liable for the extra cost. But our contract covered such contingencies."

A more common occurrence is the reluctance of many governments to pay for the job with dollars. Some contractors now will accept a portion of the payment in the coin of the country where they are working, but they appear to be in the minority (ENR Nov. 14, 1957, p. 25).

• **Comes a revolution** — Perhaps the worst obstacle to completion of a job abroad is a revolution. It is not too uncommon for a foreign project to be delayed for weeks while local battles run their course.

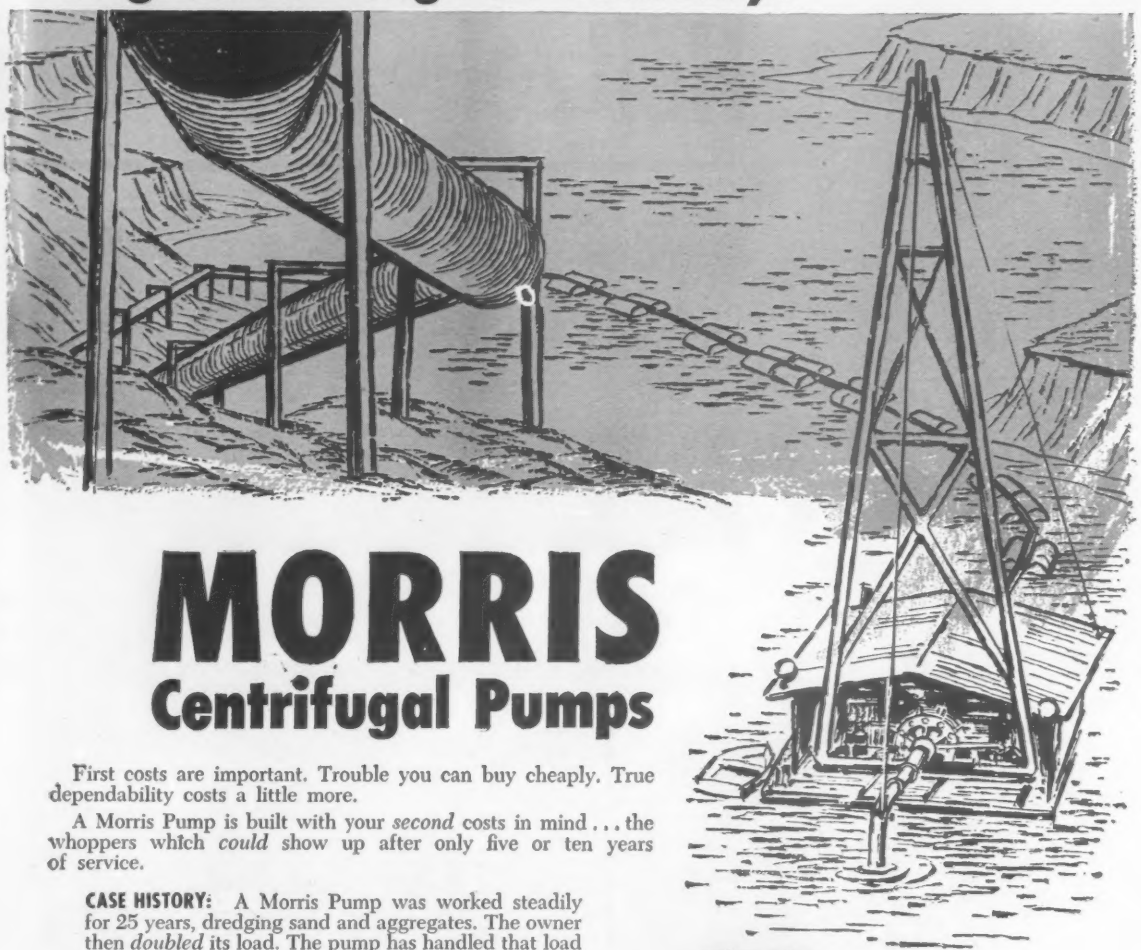
Johnson, Drake and Piper, Inc., New York, were caught in this type of predicament a few years ago while working on a job in Greece when Communist and anti-Communists were battling it out.

Greek guerillas would raid the construction camp at regular intervals. R. P. Bayard, vice-president, said that "personnel divided their time between working on the job and crouching in ditches."

Sometimes the construction company itself acts unwittingly to upset the habits of the community in which it is working. This happened to Kaiser Engineers after working out a priority system for housing workers.

Before all of the shelter units were completed, the company announced that first occupancy would go to married men. Soon after the announcement was made, the local clergy appeared at the job site office and complimented the company on being such a beneficial force for morality in the community. The workers were getting married in droves.

For greatest long-run economy:



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Centrifugal Pumps

First costs are important. Trouble you can buy cheaply. True dependability costs a little more.

A Morris Pump is built with your *second* costs in mind . . . the whoppers which *could* show up after only five or ten years of service.

CASE HISTORY: A Morris Pump was worked steadily for 25 years, dredging sand and aggregates. The owner then *doubled* its load. The pump has handled that load for four years. Maintenance? "Insignificant!" says the owner.

Against performance like this, it is the slightly higher first cost that is insignificant!

Buy durability . . . buy modern hydraulic design . . . buy year-in-year-out performance . . . buy the broad experience of the maker . . . and *then* buy on price. Morris offers you all these . . . plus the only slurry laboratory maintained by a pump manufacturer . . . to help you determine in advance the critical velocities, pressures, etc., of your pumping problem.

Talk with our engineers. Let them show you why your *second* costs should be your *first* concern.

Morris Type GA heavy duty dredge pump.

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Heltzel Flex-Plane E

UNITIZED BATCHING PLANTS to further speed set-up and dismantling time . . . to give you even greater on-the-job flexibility. The new Heltzel Unitized Plant—like these on a G. Toccalino & Son job in Detroit—is designed in three easy-to-handle sections that go together in minutes. This installation is set up as push-button drive-through for extra fast service. Batcher and scale unit is integral part of center section . . . a real time-saving innovation. (Note new Heltzel E-4 twin-batcher cement plant.)

2202

THE HELTZEL STEEL FORM AND IRON COM

FLEX-PLANE COMBINATION FINISHER-FLOAT does two jobs in one, reducing crew time to an absolute minimum. The combining of these two jobs is a natural—results in a better finish in faster time. This new machine was thoroughly tested on several jobs last season. Contractors report 4000 feet of 24-foot pavement was floated and finished in a normal day with but two or three hand finishers required. Get the facts on this profit maker before submitting too many quotations.

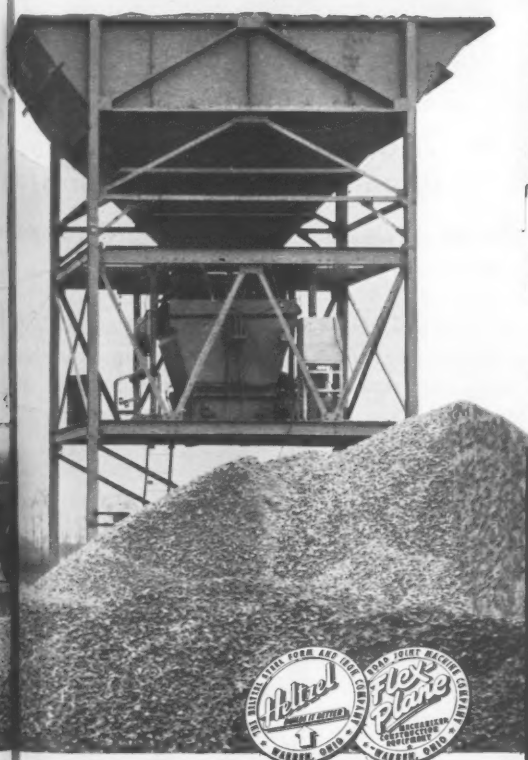
e Engineering

brings you unitized batching, improved forms and a new way to finish concrete

Modern highway design demands top efficiency in highway construction machinery. Portable . . . versatile . . . automatic . . . *fast.*

That's why Heltzel Flex-Plane Engineering works to give you the most modern road-building equipment obtainable. Up-to-date engineering, for example, has produced a definite contractors' preference for Flex-Plane over all other makes. This preference is based, of course, on proved performance.

Find out now what Heltzel Flex-Plane Engineering can mean to you — call on actual users of Heltzel and Flex-Plane equipment, and prove to your own satisfaction that this is the *modern* equipment for modern highway construction.

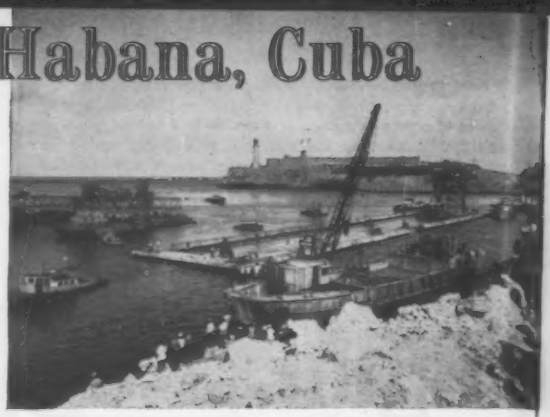


HELTZEL DUAL DUTY FORMS, such as those shown in use on the Plattsburg SAC base, have been redesigned to assure fast setting and stripping with maximum strength-weight ratio. Sizes available to exactly suit your job requirements.

ON COMPANY • Warren, Ohio

Tunel de la Habana, Habana, Cuba

Remarkable engineering accomplishment, protected from water with the **Thoro System Products**

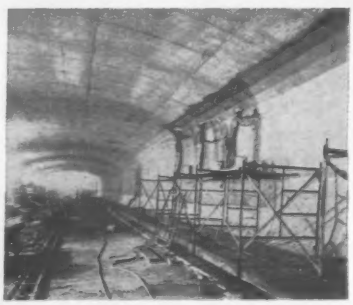


Four-lane, underwater tunnel, connecting Malecon Drive, City of Havana, Cuba with Guanabacoa near the famous Morro Castle, opening the sparsely-populated peninsula to residence and commercial activity.

Mammoth precast concrete sections are floated to location by attached pontoons, lowered 24 meters under water and connected to previously-sunken sections. ***Note the famous Morro Castle. Top, center background.***

Design, engineering and construction by Societe des Grand Travaux de Marseilles, Paris, France, 733 Meters Long, 23 Meters Wide, 7 Meters High, cost $28,500,000.00. Waterproofed inside and outside with THORO System products, THOROSEAL, WATERPLUG and THORITE.

rom Havana side, tunnel entrance grades lown to harbor pool level.



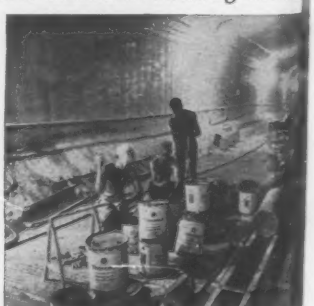
wo double-lane tunnel sections take shape; orms will be filled with poststressed concrete.

Precast sections of tunnel, honeycomb patched with THORITE Patching Mortar and entire surface protected with THOROSEAL.

Thoro System Products applied, completes the job!

Preparing interior surface for WATERPLUG and one brush and one trowel coat of THOROSEAL. All walls, floors and ceilings are sealed with THOROSEAL.

THOROSEAL is being applied to all interior surfaces. Over 800 drums of WATERPLUG have already been used, where water was entering and where sections were joined together. All honeycomb and construction faults were sealed with THORITE Patching Mortar before lowered to position in the bay.

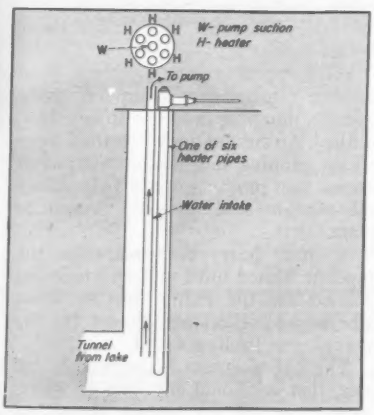


Thousands of drums of THOROSEAL, WATERPLUG and THORITE Patching Mortar are being used on this vast project.

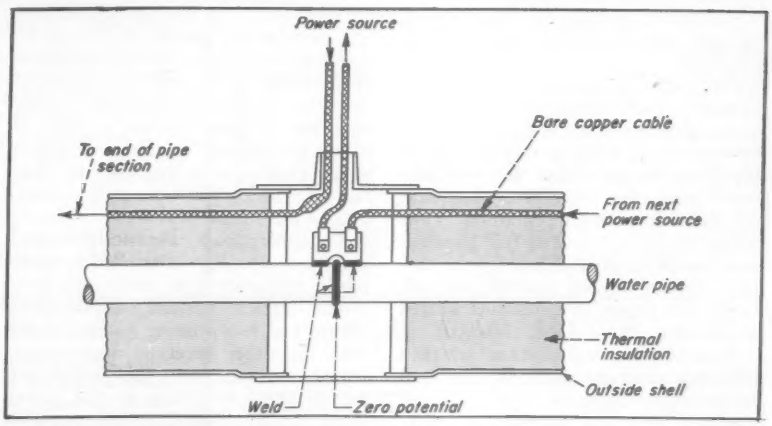
Write for literature
"HOW TO DO IT"

Standard Dry Wall Products, Inc.
NEW EAGLE, PA. CENTERVILLE, IND.

CROSS-COUNTRY PIPELINE, heated to keep water flowing, lies above ground in a permafrost region of the world.



WATER IS HEATED at intake by six heaters grouped around water suction pipe.



PIPELINE IS HEATED by utilizing electrical resistance of water pipe. A section of pipe served by one power source runs about 600 ft long.

Water for Our Far North Outposts

Jack L. Staunton
Consulting Engineer, New York City

Stanley Rosanoff
Supervising Engineer
Seelye Stevenson Value & Knecht
New York City

Out of Operation Pine Tree—construction phase of the aircraft weather and early warning radar stations in the Far North—comes knowledge of how to design and build small water supply facilities in areas of permanent freeze.

For one of the more troublesome problems encountered in setting up the relatively small encampments for the men manning the defense outposts along the coast of Newfoundland, Labrador and Baffin Island was adequate water supply systems.

These installations have to serve in many instances at locations where winter temperatures go to 60 below and in the presence of permafrost—that state where only the upper few feet of ground thaw out in summer while the ground below remains frozen all year long.

With the radar stations placed at high elevations, water sources are always far below and away from the sites —as much as 1,100 ft below and up to 1.2 miles away. Rough terrain and desire to keep personnel to a minimum ruled out hauling water and dictated instead an automatic system of supply.

Most of the water sources are lakes, and these can freeze to as deep as 6 ft.

(*Continued on p. 40*)

. . . System is drained between supply cycles

PUMPHOUSE goes up over lake. In some cases, the building sat on shore and a tunnel was dug to lead lake water to it.

So the decision was to reach for water below the maximum depth of ice, heat it to keep from freezing during its flow to pumps placed in a heated pumphouse and transport the water through heated pipeline to enclosed storage tanks at the campsite. From there, distribution through heated corridors presented no problems.

Electricity is used to provide the necessary heat. Since electric power is expensive in those areas, and power failures would result in damage to full pipelines, design called for intermittent operation of the water system, and full drainage between operations. Thus when the storage tank is full, pipeline and pumps drain, and heat to the suction pipe and transfer pipeline shuts off. Only the pumphouse remains heated at all times.

Suction pipe, and pipeline are then reheated prior to start of the next water supply cycle.

• **Heated intake**—Depending upon location of the deepest portion of the lake, the pumphouse is constructed either on top of a crib in the lake or on shore. If the latter, a tunnel is formed leading to a well under the pumphouse.

In this well is installed a 3 in. suction pipe surrounded by six immersion heaters similar to those used to keep seals from freezing in dam gates. Each heater is installed in a 3 in. pipe. The entire assembly of suction pipe and heaters is placed in a 14 in. pipe having 3 in. of insulation. This pipe in turn was put inside another pipe.

The heaters, thermostatically controlled, are designed to warm the water on the suction side of the pumps. It is necessary to heat the water at that point because for a depth below the ice, the water is at a temperature very close to 32F. In fact, some of this water may even have lost part of its latent heat of fusion. Acicular ice (consisting of numerous long crystals and hollow tubes of variable form) and frazil ice (consisting of a mush of ice spicules and water resembling slush) may be in suspension in the intake well. And such ice might clog the intake. Further, the intake pipe has to pass through a layer of frozen ground and/or a layer of frozen water. Finally, it is necessary to thaw out plugs of ice that form at the waterline in the intake pipe itself.

The pumphouse, electrically heated and thermostatically controlled to maintain a minimum 50F, holds two horizontal duplex positive displacement pumps and two priming systems, along with the other necessary appurtances. Piping and pumps in the pumphouse are designed to drain to the water source on shutdowns.

Although the pumps and priming systems are in duplicate, only one set is in operation at any one time. Motor valves, operated by nitrogen gas, are used to work the drainage system. Nitrogen was picked over compressed air, both for its complete freedom from any moisture that might freeze and ease in handling the small cylinders.

• **Zig-zag pipeline**—The heated water is sent through a cross-country heated pipeline. This is made up of factory-sealed units of 2 in. galvanized welded wrought iron pipe encased in 3 in. of glass fiber insulation and placed in an outer shell to protect from damage.

Since the areas are in permafrost regions, there was no advantage in installing the pipeline below grade. The pipe therefore is above grade and at a continuing slope from pumphouse to storage tank. This allows the pipeline to drain when not in use, so that heat is not required at all times.

The pipeline is heated by means of electric contacts attached to the pipe and connected to low voltage transformers at regular intervals. To complete each circuit, a solid bare copper wire is placed inside the pipeline units. The electrical resistance of the pipe itself provides the heat, which is thermostatically controlled.

A zig-zag pattern was followed in laying the pipeline, allowing for expansion and contraction without the use of numerous expansion loops and anchors. The only anchors are those adjacent to the pumphouse and storage tank building.

• **Operation**—The sequence of operation is then as follows: Before and after any operation, the entire system is in a drained state. When the water in the storage tank reaches a low level, an automatic switch starts the heating system in the intake and on the pipeline.

As soon as intake and pipelines are warm enough (slightly above freezing) one priming pump starts in the always-heated pumphouse. At that time, the solenoid-actuated nitrogen-operated motor valves close off the various drain lines.

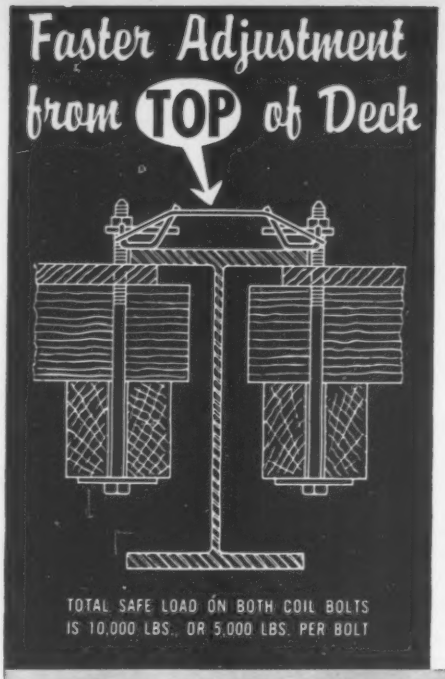
With priming accomplished, one positive displacement pump begins to operate, pumping until the storage tank is filled. An automatic switch then turns off the priming and transfer pumps and opens the motor valves. This allows the pipeline and pumping system to drain.

A time delay relay maintains the pipeline heated until sufficient time has elapsed for the entire line to drain, whereupon all heating, except for the pumphouse itself, goes off.

The entire system is designed to fail safe, that is, should anything go wrong in any part of the system, the entire system would drain.

The water supply installations were built by the Atlantic District of the U.S. Army Corps of Engineers (now Eastern Ocean District) for the U.S. Air Force. Lt. Col. Walter P. Blum was area engineer in charge of construction; Harold S. Goyette was the design contract administrator and Frank Schultz the construction contract administrator; Seelye Stevenson Value & Knecht, New York, was the consulting engineer.

The adequacy of water supply at the installations, which have been in operation for five years, has never been in doubt, although water use has been greatly in excess of that anticipated. Good locating of the sources accounted for this.



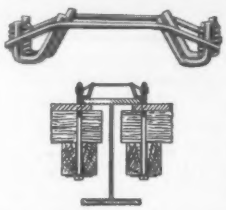
..WHEN HANGING FORMS WITH

SUPERIOR PLATE HANGER FRAMES

With Superior Plate Hanger Frames the installation and necessary adjustment to bring the deck forms tight against the flange are from *above* the deck. Coil Bolts are passed through and secured from above with coil nuts. Bolts are easily removed without binding because, (1) nuts are square and will not turn; (2) embedment of the bolts in the concrete is at a minimum since the plate is only ½" above the flange.

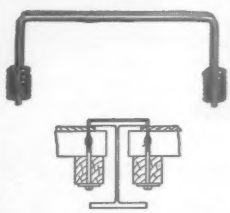
FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

STANDARD COIL HANGER FRAME



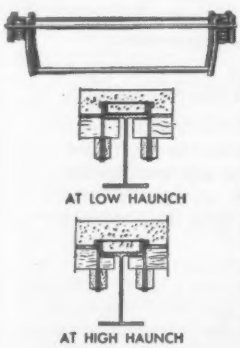
When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

COIL BEAM SADDLE



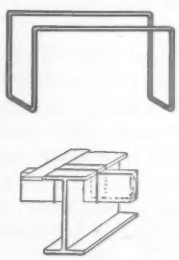
On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

SPECIAL HANGER FRAME



The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch of varying depth on the upper flange. Superior *Special* Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail). Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt.

WIRE BEAM SADDLE



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

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Now there are about 100 civil engineering agencies using electronic computers of their own while many more offices are thinking about about taking the big step. Here are some management questions worth considering.

Tips on Organizing Computer Operation

How does an engineering organization go about setting up an electronic computer operation?

There are many ways, of course, but to shed some light on the question, ENR presents here what is believed to be a representative experience.

The firm interviewed is Parsons, Brinckerhoff, Hall & Macdonald, New York, which was represented by Partner Rush F. Ziegenfelder and Deputy Chief Highway Engineer Winfield O. Salter who directs the firm's computer activities. PBHM handles engineering work mainly in the highway and heavy construction fields.

Q. Why and when did you take up with computers?

A. Board Chairman Eugene Macdonald, at the urging of Francis V. DuPont, former Commissioner of Public Roads, started the ball rolling in January, 1956, by pointing out that the firm needed what computers appeared to offer—a means for engineers to accomplish more engineering. An investigation committee, consisting of members of the bridge, highway and traffic departments in the firm, was appointed to evaluate electronic computers in this light. By April, 1956, the committee, although favorably impressed with the possibilities of computers, realized that a really thorough investigation could be accomplished best by assigning one person primary responsibility on a full-time basis. Accordingly, W. O. Salter was so assigned.

Q. How was the computer feasibility investigation conducted?

A. Between June and December, 1956, Mr. Salter completed programming courses given by two computer manufacturers, completed a high level course in electronic computer theory and design given by one manufacturer, attended various conferences and conventions in the civil engineering field related to computers and visited most all of the computer manufacturers and a couple of the early computer users in our field (California Division of Highways and American Bridge Division). Out of all this came the two most important decisions a prospective user had to make: What equipment shall be used and how shall we organize to make best use of it?

Q. Why are these decisions so basic?

A. Each make and model computer requires different programming techniques and methods; so the computer to be used must be determined before any actual computer program preparation can begin. Even more essential, though, is the organization to handle the computer. This breaks down into two questions: (a) Either have your own computer or rent time from a data processing center (now run by computer manufacturers, universities, research centers and by independent entrepreneurs) and (b) do your own programming or have it done on a fee basis by a computer center. We chose to rent our own computer and do our own programming because we felt the closer we got to the electronic computing process, the more we would get out of it. We believe you learn best by actually doing, rather than by paying someone else to do.

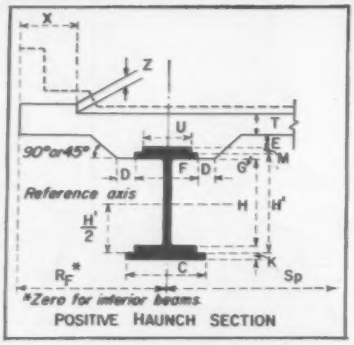
Q. Within your firm, how have you set up for programming and computer operation?

A. This was the third basic decision. We decided to concentrate computer know-how into one specialized computer staff rather than disperse it throughout our design forces. We reasoned that computer programming is a sufficiently complex art that specializing is necessary to realize the computer's ultimate capability. Also, scheduling and priority effort can best be resolved in a small group. Initially then, in April, 1957, with our computer on hand, two senior designers and two junior designers, who were experienced in all phases of bridge and highway design, began an extensive programming effort (accompanied by very little production). Several additional designers were included in portions of the work to broaden the firm's familiarity with computers and to provide a reserve of programmers. For the computer group we drew exclusively from inside the firm on the assumption that experience with the engineering problem to be fitted to computer solution and with our firm's peculiar requirements were desirable.

Q. How did you determine priority of programming effort?

A. Basically, by considering our firm's needs in conjunction with applications under way by other computer users—particularly those using the same make and model. In our case, major field priority

Composite beam design program



Scope

This program completely designs a parallel wide flange composite beam. The designer must select the basic wide flange beam and size of the top cover plate if there is to be one. The program is limited to simple span bridges and live loading must be one of the four AASHO loadings. The basic beam may be either a rolled section or a builtup welded stringer.

Input

Input for each problem consists of a value for the lettered dimensions in the sketch plus design loads, span length, beam spacing, and allowable stresses of steel and concrete.

Output

The program will automatically type out:

- Maximum moments and stresses of designed section with the minimum required thickness of bottom cover plate
- Moments and stresses at bottom and top cover plate cutoff points
- Shears at various points along span depending on number of cutoff points
- Theoretical shear connector spacing and horizontal shear stresses
- Reactions
- Approximate dead load deflection and live load deflection ratio (within 5% of actual values)
- Quantities of concrete (cu yd) and steel (lb) between bearings

Logic

The program calculates all composite properties of the initial section and develops the necessary maximum live and dead load moments and stresses from these. If bottom flange is overstressed, increments of bottom cover plate thickness are tried until a satisfactory stress is obtained.

To locate cutoff points, the program steps along the span at increments of 0.1L and back at increments of 0.01L after it has passed a point. Shears are computed at the reactions, midspan, and various other points including all cutoff points.

At times the given input data result in an unsatisfactory or uneconomical design. The majority of these cases are indicated either by a typed out "flag" or stopping of the computer. A flag is typed out preceding the flexural data output when theoretical length of top or bottom cover plate is less than 25% of the span, indicating a probable uneconomic solution. A flag also is typed out when the bottom flange stress exceeds allowable after the top plate is cut off.

The computer stops if the top flange is overstressed (since top cover plate is not incremented) or if the neutral axis of the designed beam is in the deck.

was obvious: highway and bridge design. Within these fields, consultation with section heads and senior designers determined that the specific applications offering the optimum return were, in highways: (a) earthwork volumes and slope staking data; (b) horizontal geometrics-alignment, survey traverses, polygon solution, and interchange problems; (c) vertical geometrics—profiles, superelevation. In bridge work, the priority for our office is (a) composite beam design; (b) bridge geometry; (c) retaining wall design and (d) rigid-frame pier bent design. Our first effort was composite beam design since the highway applications were being attacked by others whose programs would become available to us.

Q. How long did it take you to succeed with this first program and how much did it cost?

A. For about ten man-months of engineers' time, which allows for considerable "getting-acquainted" time, we now have a program that will completely design a wide-flange composite beam (see accompanying box for input and output data). We estimate our programming costs on this one program were $12,000, which includes payroll, overhead and computer cost for "debugging." This figure is high due to the lower proficiency level on an initial programming effort. We have calculated that 250 repetitions of the program, or design of 250 beams, will amortize this programming cost. However, in considering the overall picture of programming costs, it should be noted that we have use of many valuable programs written by other computer users, for which our development costs are practically nothing.

Q. What programming lesson did you learn from this first effort?

A. The value of a complete analysis of what you intend to accomplish became apparent. If possible, future extensions of the program should be considered so that the initial program can include assignment of computer storage space so that extending the program will require a minimum of revision. We also found it uneconomical to worry about refining the program to use less computer time. Inclusion of more sophisticated programming techniques became second nature after some practice.

Q. How has the computer manufacturer helped you?

A. We are using the Bendix G-15D compter. A number of early users of the G-15 got together in March 1957 to form a Users Committee on Civil Engineering Applications with the help of the manufacturer. Objectives of the group, which now numbers 26, are simple. Users want to reduce programming costs and elapsed time for programming. We minimize duplication of effort and share completed programs. The computer maker assists—not directs—by undertaking various programs designated by the group, and by developing "service" and "interpretive" routines which simplify programming. We are very pleased with the results of the users group, which now has 25 engineering programs available and 30 more scheduled for early completion. And we are continually surprised and pleased with the genuine cooperative effort by members—especially those in private practice—who are often in direct competition with one another for design engagements.

Q. How will you set up your computer staff for full-scale computer production?

A. We are about at this point now with the composite beam program now in production, with programming well along on five other original efforts, and with revision of several user group programs nearing completion. We consider that computer staff duties fall into two broad classes: programming and computer production. Programming, which requires considerable computer time for debugging, involves analyzing present manual design methods for feasibility and economic justification, preparing "block" diagrams, or mathematical logic, for a new or expanded program, transferring the logic into instructions the computer can understand, and, finally, testing and debugging the program. We associate with production the preparation and review of input

data, operation of the computer and associated equipment, and maintaining a catalog and procedures manual of available programs for designers' use. Trained civil engineers, approximately four of them are handling and will continue to be responsible for programming, while technicians will be trained for the production functions.

Q. Aside from the applications you mentioned previously, what others are you looking to?

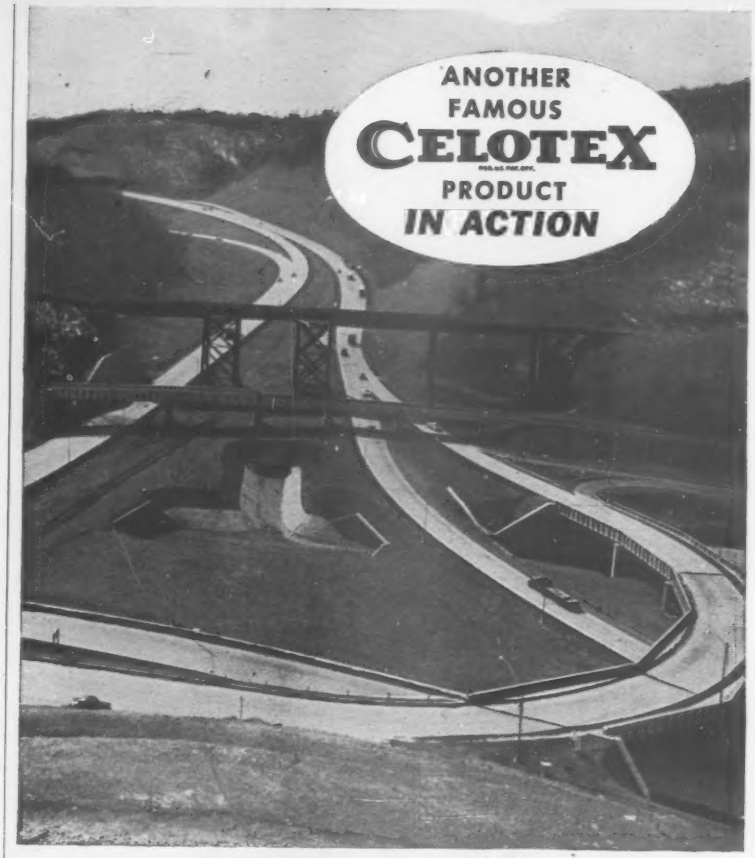
A. A comprehensive highway interchange program, prestressed beam design, traffic data analysis, hydroelectric system operation, and flood routing. All of these, incidentally, have been programmed by some computer user.

Q. Just how much help to you is a program prepared by others for your model computer and for another computer?

A. It helps considerably, but not always as much as you would guess. Even a program prepared for the same computer may need some detailed modification for our use. A highway earthwork program prepared by a state highway department for example, will have to be revamped and extended since our firm does work in a great number of states and must have computer programs able to handle differing specifications. We estimate that a shared program for the same computer will save us from two-thirds to all of the programming cost and time. With a program prepared for another computer, we would rarely save more than one-third of the programming time, if that. In other words, it is quite difficult to go from one computer to another, even different models of the same manufacturer. This places a premium on cooperation among users in the same field having the same computer. Correspondingly, the Bureau of Public Roads' program library is limited in this respect, since only the analyses and block diagrams are available. This is not to detract from the truly outstanding job the BPR is doing in promoting the use of computers. The number of computer makes and program scopes prohibits the bureau from doing more than maintaining a library of program analyses.

Q. Do you have advice for other engineering organizations entering the computer business?

A. We feel there is no substitute for actually using a computer in your organization directly. Service organizations have their place, but utilizing them leaves, at times, too much of a gap between the engineer and solution of his problem. Today, there is a wide enough range in size and cost of computers so that most engineering organizations should be able to justify economically the use of rented or purchased machines of their own.



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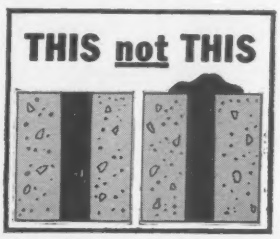

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Midway Is

Nature's coral stockpile around tiny Midway Island provided builders with a ready aggregate supply when channel and harbor were dredged.

A $40 million construction job that will make Midway Island a key bastion in the Airborne Early Warning System of the Pacific will be completed sometime this year.

First construction emphasis was on certain core facilities that would make the base completely operational—and these were completed by mid-1957. A major operation was reconstruction of a 7,900 ft asphalt runway together with parking aprons and concrete service ramps. Buildings included in the first part of the construction were an air control tower, radio and radar building, 180 man barracks and a 1,000 man mess hall.

Refinements to complete the project include a 300 x 556½ ft hangar and several miles of seawall, plus some harbor dredging. Additional living facilities (including a school)—for enlisted men, officers, and dependent families—also will be built.

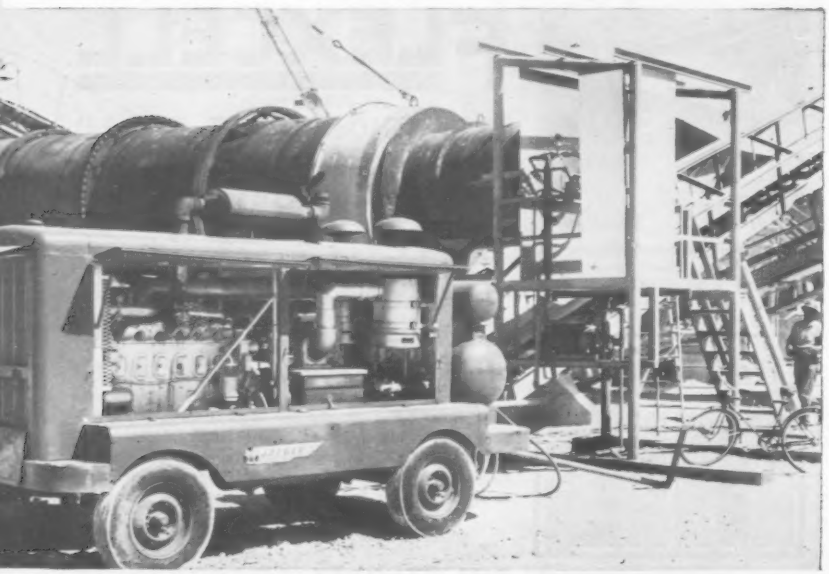
While most of the concrete aggregate used consisted of coral from the harbor dredging operations (some 3 million cu yd were moved), 26,600 tons of basaltic aggregate had to be barged 1,150 miles from Honolulu. While this long haul of material proved costly, it had to be done to insure good quality concrete. Use of coral aggregate alone would not have met Navy specifications.

The hangar includes a two-story, 100-ft-wide center core running the length of the structure to house ships, equipment, briefing and schedule rooms and the like. Each side of this core is flanked by 100-ft-wide bays, divided into three sections to accommodate six large aircraft.

Construction of the facilities is a project of the Bureau of Yards and Docks of the U. S. Navy and is under the direction of Capt. F. C. Ray, (CEC), USN, District Public Works Officer, 14th Naval District. Resident officer in charge of construction is Capt. John Dominy, (CEC), USN.

Design of the base was a joint venture of Pereira & Luckman and Harland Bartholomew & Associates. Construction is being handled by the Hawaiian Dredging Co., Ltd., of Honolulu, with Terminal Steel Co. of Honolulu subcontracting for fabrication and erection of the steel work.

FROM HARBOR BOTTOM the coral is dredged by dragline and stockpiled for use as aggregate for most of the concrete construction on this tiny Pacific island.



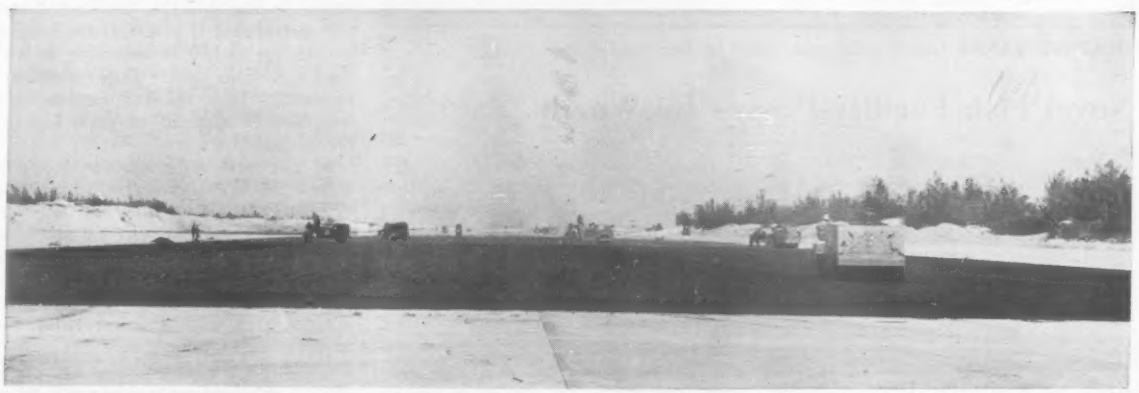
DRYING KILNS, where wet sand, sticking to the coral's pores, is removed by drying in a 7 ft dia, 36 ft long, rotary oil-fired drier. Coral proved useless without separation.

Island Becomes Warning Base

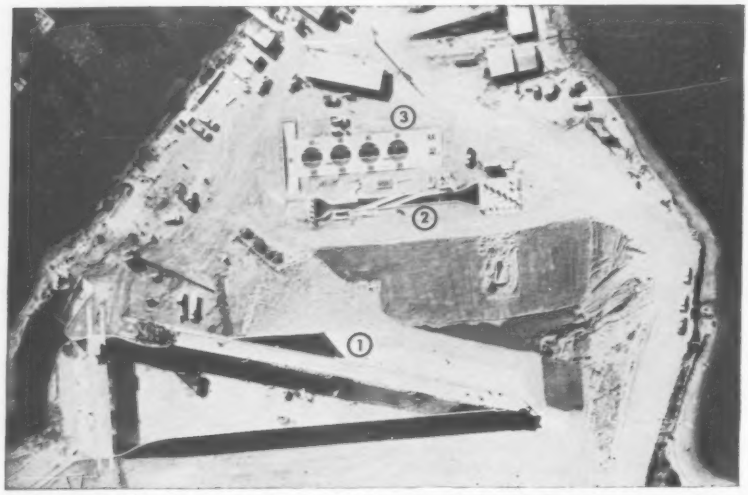
AIRCRAFT HANGAR is one product of the coral aggregate concrete and structural steel. Hangar cost over $3 million.

MAIN POWER PLANT addition also is made up of coral aggregate concrete. Two 600 kw generators supply power for the network that electrifies the island.

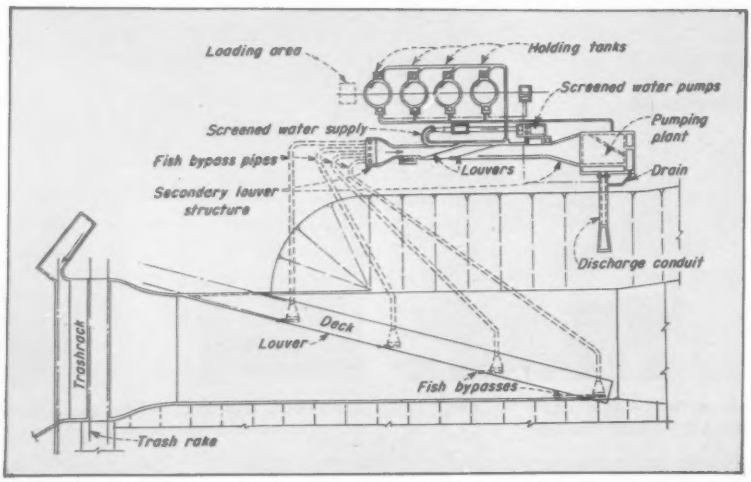
CONTROL TOWER directs aircraft and houses electronic-control equipment.



FINISHED RUNWAY shapes up to support 50,000 lb wheel loads. Length of 8,000 ft with 200 ft width provides adequate space for smaller jets. Asphaltic pavement, including coral subbase, has minimum thickness of 17 in. for heavy jet loads.



THREE STAGES of the $2 million Tracy fish salvage facility are the primary louver structure (1) that guides fish into pipelines leading to the secondary louvers (2) where the fish pass between parallel louver structures and cross into a separate stream of clean, screened water. At this point a bypass pipe takes them into 20 ft dia holding tanks (3).



HOLDING TANKS (above) collect fish which are later trucked downstream.

Novel Fish Facility Proves Its Worth

A $2 million fish bypass has been built at huge Tracy Pumping Plant in California that separates and collects fish as small as 1 in. in length from moss laden river flows up to 5,000 cfs. During last year's heavy pumping period (June through August), it saved nearly 7.5 million fish that would have been sucked through Tracy's pumps that lift San Joaquin and Sacramento River water into the Delta Mendota Canal of Bureau of Reclamation's Central Valley Project.

The fish preservation facility employs louvers instead of screens to deflect fish. Fish are sucked tail first into the main intake channel to the pumping station. Passing through a trashrack, they swim along a 320 ft by 25 ft high primary louver set diagonally in the channel until deflected into one of four bypasses and from there into 36 in. pipes. Slats of the louver, which pass water and deflect fish, are set in a vertical position.

In the second louver structure, fish are separated from mossy water in an unusual manner. Here, two diagonal louvers, similar to though smaller than the primary louver, direct fish into the holding tank piping. Clean, screened water is introduced along the outside wall and fish cross into it at the end of their journey along the louvers. Fish are kept from swimming through the louver by turbulent flow caused by the slats.

Fish end up in a 20 ft dia holding tank where a wire mesh cylinder catches them while water continues to a sump. Finally, the fish are transferred to a 500 gal bucket to await trucking downstream.

Concentration of fish is upped 40 times by the first louver structure, and 640 times by the secondary louvers. Settings have to be changed only when there is a change in the number of pumps in operation.

The Tracy fish salvage facility was designed by Russel Vinsonhaler of the Bureau of Reclamation and Daniel W. Bates of the Fish and Wildlife Service, aided by George O. Black of F&WS. They shared a $12,000 incentive award for their efforts.

Optical Plummet Saves Money at Montana Dam

The optical plummet has been found accurate for heights up to 150 ft in setting construction block layouts at Noxon Rapids Dam on Clark Fork in Montana.

The plummet is being used by Cliff Beck, an engineer with Ebasco Services, Inc., New York, to circumvent the undesirable features of using a regular surveyor's plumb bob on piano wire to carry up the main control point for placement of concrete.

The effect of wind and the need for access to the point is eliminated and the instrument is practical for heights ranging up to 150 ft, according to Mr. Beck. At the same time, manpower economies have resulted because one less man is required to make up the survey party.

In the new system, a target is attached to bolts projecting from the concrete in one of the first lifts on the vertical upstream face of the dam. The plummet is then used as a plumb bob to position a combination optical plummet and survey transit base adaptor at a higher level. After the adaptor is positioned over the target, the adaptor is clamped and the plummet is replaced with a transit. The block layout then proceeds by conventional survey methods.

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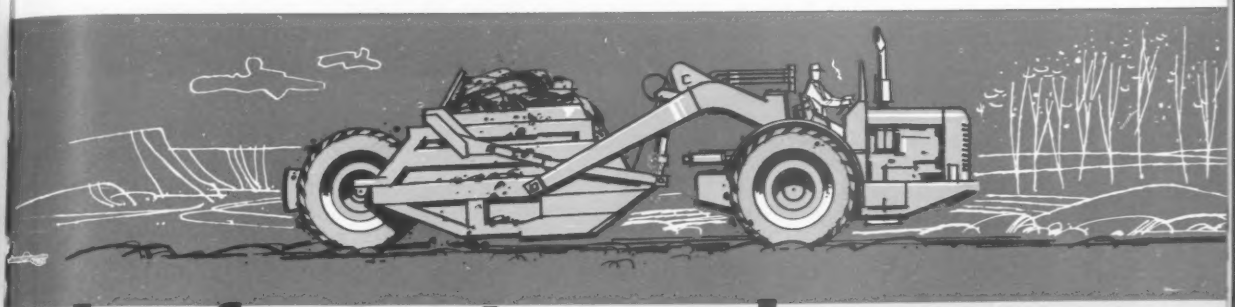

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Fastest-loading big machine in the business... 280 hp moves 20 yd loads at high speed.

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Profit-boosting performance and dependability on

TS-260

A new measure of performance in this size range . . . 200 hp . . . 14 yd . . . full 90-degree turning.

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True versatility and economy in a utility machine . . . 155 hp . . . 9½ yd . . . turns non-stop in less than 25 ft.

sic advantages in every size . . .

- high power-to-yardage ratio
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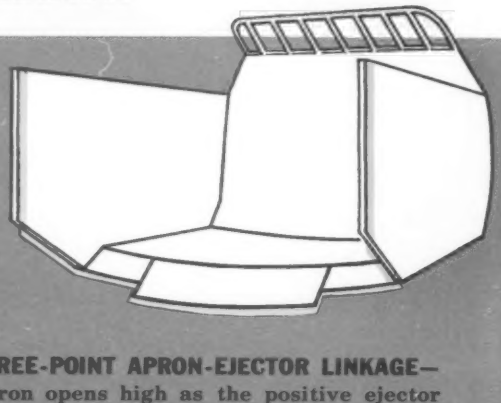

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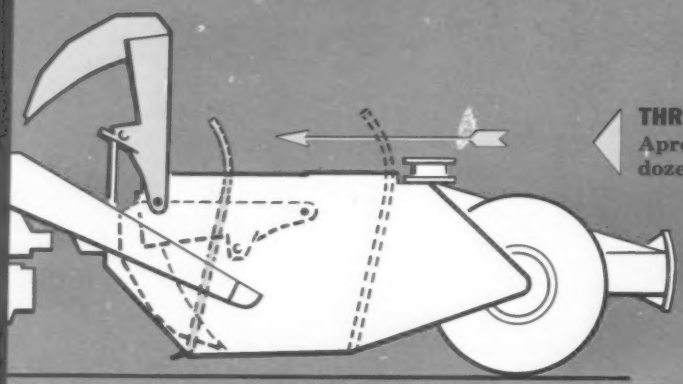
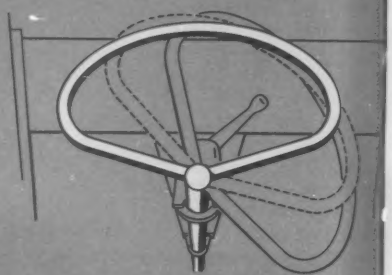


THREE-POINT APRON-EJECTOR LINKAGE— Apron opens high as the positive ejector dozes out the load . . . clean and quick.



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Litho in U.S

Warped Wood Shell Roofs Quarter Acre

With no interior supports, a double-curved wood shell 115 ft square and only $1\frac{7}{8}$ in. thick roofs a new weaving shed at the Royal Wilton Carpet Co.'s broadloom rug factory in Salisbury, England. Cost of the building, excluding lighting and heating, reportedly totaled only half the usual cost for a building of this size. It was constructed by 11 maintenance men on the rug firm's regular payroll.

The roof is made up of four identical hyperbolic paraboloids. Square in plan and symmetrical about their diagonals, each shell has two opposing corners upswept, the other two downcurving. High corners of the component shells occur at the center and four corners of the building. Low corners occur at the midpoints of the four sides of the building, where they rest on the four reinforced concrete columns comprising the entire support of the roof.

• **Planks are nailed, stapled**—Built in place on straight tubular steel scaffolding in parallel rows, the shells consist of three layers of $\frac{3}{4}$ x 5 in. tongue-and-groove European redwood plank. Edge beams bordering each section were made of twelve 1x10 in. (nominal size) planks—six above and six below the shell. The bottom and middle layers of the shell were stapled together. The top layer was fastened with $1\frac{3}{4}$ in. nails. In addition, the layers were glued together in a 6 ft wide zone bordering each section. The edge beams were glued also. Gluing pressure was maintained by clamps and bolts.

Horizontal thrust of each section is countered by a tie rod connecting the supporting corners. Each of the four corners of the building is anchored against uplift by two vertical guy wires.

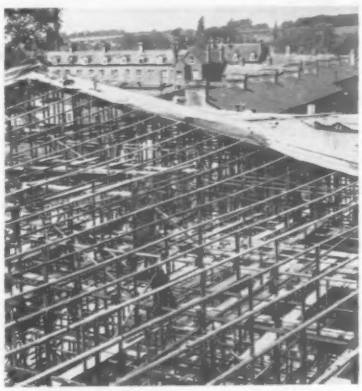
On the underside, the shell was sprayed with two coats of polyvinyl acetate, a tough clear plastic varnish. Outside, a builtup roof was installed.

The walls are brick cavity-type, topped with a continuous band of wood-framed windows. The window mullions, instead of rising vertically, are normal to the inclined edge beams, thus accenting the unusual roof lines.

Robert Townsend, of Bath, was the architect for the project. He and H. Tottenham, a civil engineer of the Timber Development Association, designed the shell structurally. Prior to construction, the T.D.A. research station built and tested a quarter-scale model.

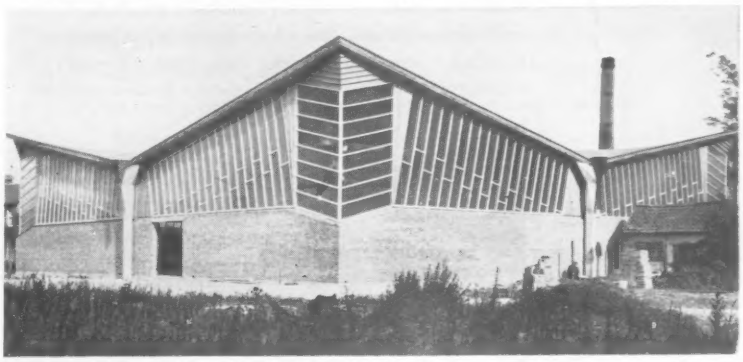
(*International cont. p. 54*)

HYPERBOLIC PARABOLOIDS built of wood plank by owner's maintenance men cover more than 10,000 sq ft of unobstructed floor area of a British rug factory.



TUBULAR SHORING in straight bents was a double-curved form for the shell.

WOOD PLANK making up the three layers of the shell are $\frac{3}{4}$x5 in. stock.



ODD ANGLES created by inclining the wood mullions normal to the roof edge heighten the visual interest of the unusual roof structure. Walls are brick cavity-type.

"We learned to use the Bendix G-15 computer in just four hours."

Anyone who can learn to operate a desk calculator can now use an electronic computer. New techniques developed for the Bendix G-15 Digital Computer make it so easy to use that the fundamentals can be mastered in thirty minutes...a working knowledge of programming in four hours or less. The G-15 can be used by the men who know their own problems best, right in their offices and laboratories, and often at 1/10th the cost of "computing center" installations.

G-15 ADVANTAGES Memory and speed of computers costing four times as much • Paper tape output and 250 char/sec paper tape input at no added cost • 1,200,000 words of magnetic tape memory available • Punched card input-output available • Extensive library of programs furnished • Strong users' sharing organization • Proven reliability • Nationwide sales and service • Lease or purchase.

Bendix Computer

DIVISION OF BENDIX AVIATION CORPORATION

Built and backed by Bendix, the G-15 is serving scores of progressive businesses, large and small, throughout the world. For the details, write to Bendix Computer, Department F-2, Los Angeles 45, California.

$40 Million Road Program Is Under Way in Ethiopia

A vast new Ethiopian highway development program covering a 70,000 sq mi area has started with aerial surveys by Hunting Aerosurveys, Ltd., of London, under a contract with the Imperiol Highway Authority of Ethiopia.

The U. S. Bureau of Public Roads is managing the program, which is being financed by a $15 million loan by the International Bank supplemented by $28 million put up by the Ethiopian government.

After aerial photographs of the country to be covered by the proposed system have been taken, they will be interpreted to determine the best topographical location for the roads. The photographed areas will be principally those in the highly fertile lands of the west central and Lake Tana regions of Ethiopia, where highway development will contribute most to expansion of Ethiopian economy.

For final location, ground survey and design, earth quantity computation, and drafting of tender documents, a firm of British engineers will work jointly with Hunting Aerosurveys.

Construction will follow completion of the engineering work, and international bids for this work will be invited.

Prefab Room To Be Module in USSR Apartment House

Prefabricated rooms, complete with all fittings and including wiring, will be used in the construction of an apartment house in Dnepropetrovsk, Russia, according to a Soviet newspaper. Construction costs will be halved and assembly time will be only one-sixth the time required for conventional prefabricated buildings, the newspaper says.

British To Build World's Largest Boiler Unit

A reheat boiler unit with a capacity of 550,000 kw, rated at 3.75 million lb of steam per hour and working with steam conditions of 2,400 psi at 1055 F, has been ordered by the British Central Electricity Generating Board.

International Combustion, Ltd., will make the unit which is the largest ever designed in the world. Its turbo alternating set will be cross-compounded from two 275,000 kw units.

Two of these 550,000 kw boilers are to be installed in a 1.1 million kw power station near Doncaster in the industrial north of England.

North Ward School

PORTLAND CEMENT ASSOCIATION PHOTOS

For Low Cost Beauty

Architectural Concrete and Concrete Masonry made with Ideal Cement provide a BEST BUY for Schools

An economical dual application of concrete was developed for the construction of the North Ward Elementary School in Superior, Nebraska. On both the inside and outside of this handsome school building, concrete walls were left exposed.

Architectural concrete exterior walls provide an attractive, low-annual-cost exterior treatment for the entire building. On the inside, lightweight concrete masonry walls fulfill a load-bearing as well as a decorative purpose. The interior ceiling was constructed of exposed concrete filler-blocks to provide additional economies when used with the thin concrete roof slab.

This unique school building provides a total of 22,750 sq. ft. of space at a cost of $11.33 per sq. ft.—is an outstanding example of the way architectural concrete and concrete masonry provide beauty, economy, and long life with minimum maintenance. Ideal Cement was used exclusively for all concrete and concrete masonry units in North Ward Elementary School.

PORTLAND IDEAL CEMENT

IDEAL CEMENT COMPANY

DENVER, COLORADO

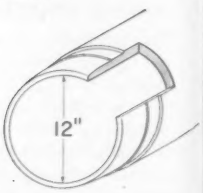
15 Plants and 4 Terminals Serving
Some of the Most Rapidly Growing Areas of the Nation

Now! Transite Sewer variety

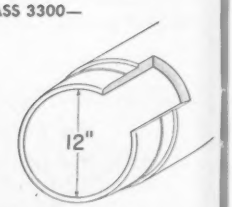
Transite's Ring-Tite® Coupling is designed for high-speed assembly . . . presents no problem in joining lengths of varying crushing strengths or diameters.

CLASS 1500—

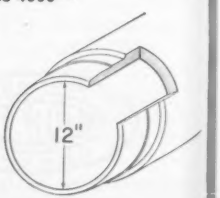
CLASS 2400—



CLASS 3300—



CLASS 4000—



CLASS 5000—

Transite Sewer Pipe now classed by Standardized Crushing Strengths

Based on A.S.T.M. bearing method (strength in lbs. per lineal foot)

Size Inches	Class 1500	Class 2400	Class 3300	Class 4000	Class 5000
6	1500	2400	3300	—	—
8	1500	2400	3300	—	—
10	1500	2400	3300	4000	5000
12	1500	2400	3300	4000	5000
14	—	2400	3300	4000	5000
16	—	2400	3300	4000	5000
18	—	2400	3300	4000	5000
20	—	2400	3300	4000	5000
24	—	2400	3300	4000	5000
30	—	—	3300	4000	5000
36	—	—	—	4000	5000

Pipe is available in a wide of new crushing strengths

Progressive new concept permits greater efficiency in sewer design . . . reduces overall costs through closer matching of crushing strengths to needs!

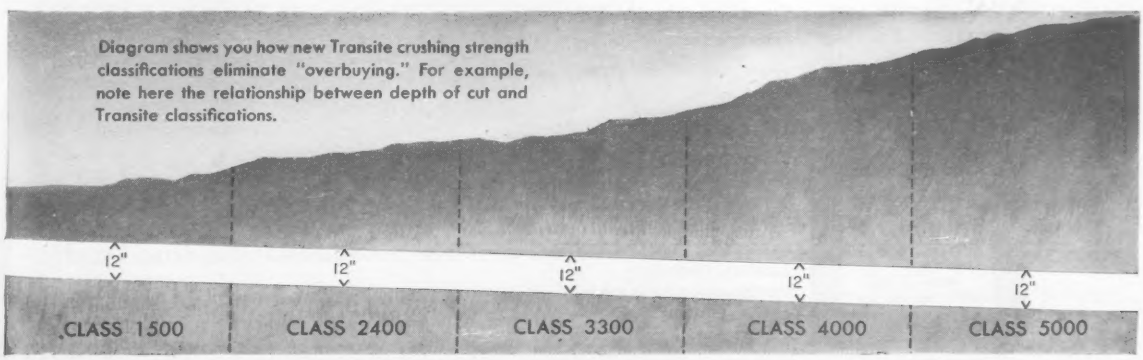
HERE'S THE BIGGEST sewer pipe advance in years! In a revolutionary move, Johns-Manville introduces five new sewer pipe classifications to greatly simplify accurate sewer pipe specification . . . permitting overall cost saving to a degree never before possible.

Through improved manufacturing methods, Johns-Manville brings you Transite Sewer Pipe in a variety of the more widely needed crushing strengths: 1500, 2400, 3300, 4000, and 5000 lbs. . . . in 11 different diameters ranging from 6″ to 36″ (*see chart*).

Permits greater efficiency in system design. To the engineer, the new Transite crushing strengths mean new ease in achieving greater efficiency in sewer design. For now he can plan pipe layouts as he has always wanted—selecting pipe on the basis of depth of cut, width of trench, type of soil and manner of bedding. The result: far greater overall economy through use of more realistic safety factors . . . reduction in the need for over-design . . . with costly concrete encasement and cradling needed in fewer areas.

Let us send you TR-94A, Sewer Design Flow Chart and DS-366, Transite Specifications. Write Johns-Manville, Box 14, N.Y. 16, N.Y. In Canada, Port Credit, Ont.

JOHNS-MANVILLE



BOND BREAKER, MOISTURE BARRIER! VISQUEEN TRADEMARK FILM SAVED MONEY BOTH WAYS

Ross & Farthington Construction Company, Wichita, Kansas, scored twice in saving when they used VISQUEEN film in construction of the Osage City School. Architects Williamson, Loebsack and Associates specified VISQUEEN film as a bond breaker because the film produces better concrete surface finishes and achieves great financial savings for contractor and Board of Education through re-use of one set of forms.

The architects specified VISQUEEN film as a moisture barrier under the slab floor because it provides lowest cost *permanent* protection against penetration of subsoil moisture.

Only VISQUEEN Film is Made in* Seamless *Widths to 32 Feet

Write or use the information request tag for use and application details.

information request tag
VisQueen
Trade Mark
clip this tag. #EM3
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VISQUEEN *film—the first and foremost polyethylene film.*
A product of the long experience and outstanding research of **VISKING COMPANY** *Division of* UNION CARBIDE *Corporation*
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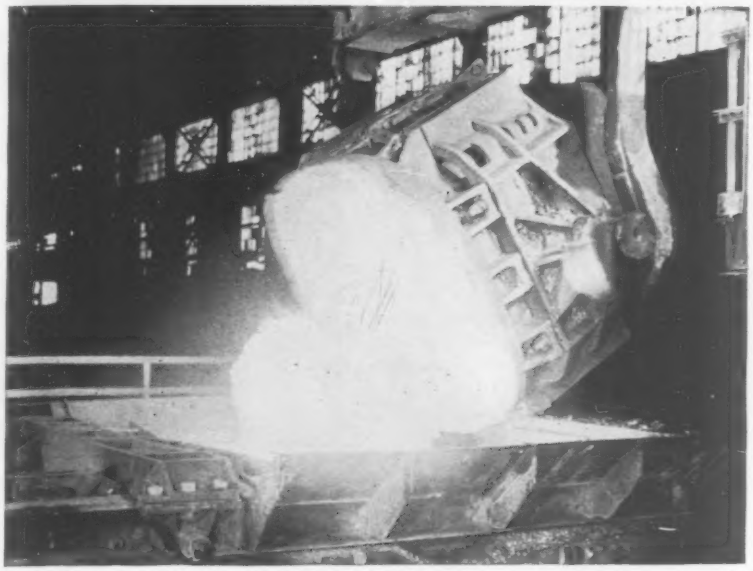


Process changes produce a new . . .

Wrought Iron More Resistant to Corrosion

A wrought iron whose corrosion resistance is increased 25% over standard wrought iron is available. Marketed under the name 4-D Wrought Iron, the product is the result of 17 years of research, laboratory and in-service tests.

The improved wrought iron is made by increasing the extent of deoxidation of the base metal-iron, slightly increasing the phosphorous content, and using a more siliceous slag. The manufacturer claims the enhanced ability to resist corrosion stems from the more uniform distribution of iron silicate fiber through the metal.

Also because of the fiber distribution, the metal is also said to be superior to standard wrought iron in physical and mechanical properties.

4-D wrought iron conforms to existing product specifications. It will be offered at no increase in cost over standard wrought iron. The improved product is seen applicable in the same services as the standard product. A. M. Byers Co., 1609 Clark Bldg., Pittsburgh 22, Pa.

Trailer for Concrete Beams Self-Loads

A straddle trailer has been designed to haul large concrete beams from plant to projects. The trailer is built to load, carry and unload (without additional equipment) up to 70 ft lengths of prestressed concrete beams. Each beam can be 4½ ft high by 16 in. wide with a weight of about 20 tons.

Since the prestressed beams must be handled delicately, dual rubber-tired wheels actually straddle the concrete beams. After pins are inserted in each end, the hydraulic lift loads the sensitive cargo automatically.

The trailer is about 80 ft long and weighs 10 tons. The outstanding feature claimed for the machine is its ability to self load and self unload. Neither the hauler nor the manufacturer needs to maintain any other beam loading equipment in the casting yard or at the delivery site. Lufkin Foundry and Machine Co., Lufkin, Tex.

Pre-Screening Unit Aids Portable Crushing Plant

A pre-screening attachment recently announced for mounting on Cedarapids portable crushing and screening plants is said to provide two full decks of scalping area ahead of the crushing plant, for added flexibility.

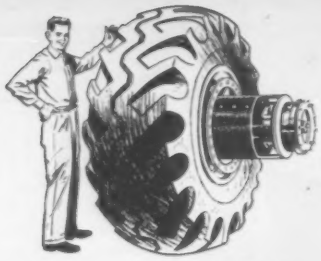
The new unit is designed to remove or by-pass excessive fines or dirt and make the operation of a single portable plant more productive.

The attachment is said to be interchangeable with the standard hopper and feeder of either a Cedarapids Commander or Junior Tandem Plant. It consists of a standard 10 ft double-deck horizontal vibrating screen with drives from the plant, and drive to the optional feed conveyor if desired. The screen is mounted in a frame over a hopper containing a gate that can be arranged to take off all undersize material passing both screen decks, before it reaches the plant crushers. Oversize from the top screen deck is conveyed to the plant for processing, while material retained on the second deck falls through a chute to a product conveyor that can be arranged to deliver the graded material from either side of the plant. Iowa Manufacturing Co., Cedar Rapids, Iowa.

Steel-Framed Homes Come In a Variety of Styles

A line of steel-framed houses, priced between $10,000 and $35,000 plus building site costs, are available in a variety of floor plans and elevations. "Steelstyle" homes feature a folding-type wood truss and use about 3½ tons of steel in panel framing sections. Clear spans range from 24 to 28 ft, so that interior wall panels are non-load-bearing. U.S. Steel Homes, New Albany, Ind.

(*New Products continued on page 60*)



Electric Wheels

by R. G. LeTOURNEAU

For thousands of years the wheel stayed pretty much the same as it was invented. All it had to do was roll. Power came from somewhere else, either pushing or pulling. Even as you and I roll around on wheels right now things are still pretty much the same. You might say that there's been less change in the wheel than in any other invention.

Now, in the past fifty years or so, the world has put power to its wheels. We don't use animals or people anymore to push or pull our vehicles; we use engines. But the engines do the same thing . . . they push or they pull.

The way things are now, you have an engine that produces power. And then you have to worry about transmitting that power to the wheels so the vehicle will move. That's why the machines have transmissions, driveshafts, differentials, belt drives, chain drives, and all kinds of drives. By hook or crook these systems get some of the engine power to the wheels. But by the time you take into account friction and mechanical inefficiency, a lot of power has gotten lost along the way. Basically, getting power to the wheels this way is still a lot like the idea of the pushcart or the horse and buggy . . . the power comes from somewhere else and all the wheels have to do is roll.

You'd get a lot more power from the wheels onto the road, where it counts, if you had the power right in the wheels. And that's what we've done with our LeTourneau Electric Wheels. On our vehicles, every wheel has a powerful motor built into the hub — every wheel drives.

A diesel-powered generator produces electricity and cables carry the current to the wheels. But the wheels do all the work . . . and they don't lose any power through transmissions, driveshafts and differentials.

Another thing about this kind of power is that it's always looking for a way to work. Sometimes you get a wheel on a slippery surface where there's hardly any traction. That's when the ordinary wheel spins. But with our Electric Wheels, the extra power that isn't being used shifts right over to the other wheels, and you keep right on going.

The same power that drives the wheels also brakes them. It's called dynamic or regenerative braking. All that means is when you're going downhill, for example, momentum causes the wheel motors to act as generators. A tremendous field of magnetic force holds you at the speed you want to go and with it you can brake right down to a stop. It's all done with electricity and you have no brake drums and linings to wear out. You never need a brake job.

We're using Electric Wheels on all our mobile, heavy duty equipment for the logging industry and on our big, off-road transporters that can carry 100 tons or more. When you've seen them at work doing all sorts of big, tough jobs, you'll realize that power in the wheels is a big step forward. It's a step you can take. Start by telling us about your machinery problem — and let us put Electric Wheels to work for you.

R.G. LeTourneau

LET

R.G. LeTOURNEAU INC

2723 SOUTH MAC ARTHUR • LONGVIEW, TEXAS

R-108

. . . New Products

Heavy Duty Drill Offered After Completing Tests

With field tests completed, a new model, the 105TA, in the Portadrill line is offered for blast hole and exploratory drilling in all kinds of rock. In sandstone, shales, limestone and other similar formations the drill is rated at 300-400 ft of 9 in. hole per shift, using standard roller cone rock bits.

The drill is mounted on an Eimco 105 diesel tractor with 125-143 hp, which supplies all power through chain and gear type power transfer cases. Two rotary vane compressors, furnishing 1,000 cfm, remove cuttings with normal pressures of 15-17 psi; for cleaning the hole in wet or sticky substances, up to 50 psi are available. The compressors may be used singly or together.

With the mast moved hydraulically, all operational functions are controlled from a panel at the rear of the drill. Patented shock-hammer "break-out" tongs speed making or breaking of drill stem joints. An automatic constant feed system maintains down pressure on the bit. The drill is leveled and stabilized by hydraulic jacks. PORTADRILL DIV., THE WINTER-WEISS CO., 2201 BLAKE ST., DENVER 5, COLO.

Versatile 15-Ton Truck For Heavy Construction

An off-highway truck of 15-ton capacity, made available now in the end-dump style, is recommended by the manufacturer for use in quarries, mines and heavy construction work, because of its versatility.

The diesel power plant is available in 175 or 220 hp; and single or three-stage torque converters are offered. DART TRUCK CO., KANSAS CITY, MO.

another big step ahead... **the Blaw-Knox EXPRESS Paver**

Here is the newest model of the world's most advanced Bituminous Paver. It is designed to bring contractors all over America bigger profits through improved, more automatic operation.

Better Finishing

New one-piece screed of abrasion-resistant alloy steel provides smoother finishing. Brand new screed extensions install faster. Big cam-type adjustment bolts eliminate shimming, give you a true line surface up to sixteen feet. Two screed heaters are standard on the Express Paver for faster heat-up, more even heat distribution. Positive and negative crowns adjustments are made from a turn buckle-type adjustment nut above the screed. Planing adjustment point is located *at the screed.*

Better Tamping

An entirely new tamping system has been incorporated for easier operation, greater compaction and density. Single tamper drive is easier to service, removes synchronization problems. Tamper frames are welded from heavy steel angle. Tamper shoes are one inch thick high alloy steel plate with a ¼-inch horizontal compaction surface. Tamper shield design eliminates bridging by giving a rolling action to the material.

Better Spreading

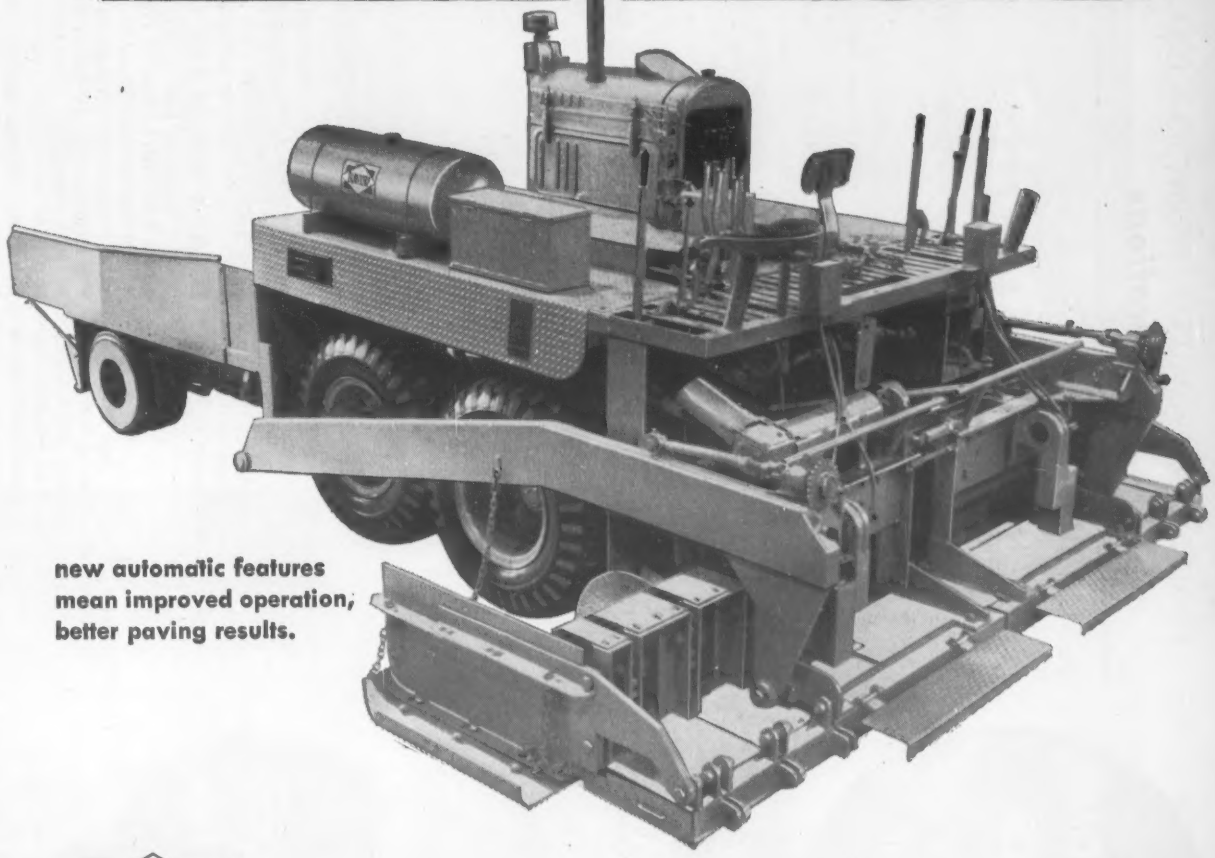
New Augers on the Express Paver are tapered toward center for better distribution of the mix. Auger faces are abrasion-resistant for longer wear. New hangers support the augers and are equipped with sealed anti-friction bearings.

Air Controls

For a small additional investment you can specify the new air control package for more automatic operation of material feed, traction clutch and brakes. Material feed control automatically shuts off conveyor and augers when proper level of mix is reached.

The new traction air clutch provides smoother starting, no clutch adjustment and hydraulic braking is easier with air actuation. Air system is operated from a convenient finger-tip panel which is quickly moved to either side of the machine.

Get full season benefits from this new, improved, machine. Your Blaw-Knox distributor has all the information. Call him today!



new automatic features mean improved operation, better paving results.

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BLAW-KNOX COMPANY

Construction Equipment Division

41 Charleston Avenue, Mattoon, Illinois

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TANKS
for LIQUID or DRY
STORAGE
above or below ground
CONE ROOF; FLOATING ROOF, DIAPHRAGM AND LIFTER TYPES FOR PRODUCT CONSERVATION
SPHERES FOR GAS AND LIQUID STORAGE
WATER RESERVOIRS ELEVATED TANKS STANDPIPES
and
STEEL PLATE FABRICATION
PLATE FABRICATION
STEEL • STAINLESS • ALLOY
CLADMETAL
HAMMOND
IRON WORKS
WARREN, BRISTOL and PITTSBURGH, PA.
PROVO, UTAH • CASPER, WYO. • BIRMINGHAM, ALA.
Sales offices throughout the U. S. A., licensees and sales offices in many foreign countries including Argentina, Belgium, Brazil, Canada, Columbia, Egypt, England, France, Haiti, Italy, Japan, Mexico, Netherlands, Peru and West Germany

Publications

Glass—Catalog 58-G describes the company's complete line in 20 pages and Catalog 58-I describes industrial applications of diffusing heat absorbing and wired glass. Mississippi Glass Co., 88 Angelica St., St. Louis 7, Mo.

Portable pipe—An eight-page illustrated brochure describing mill-grooved lightweight steel tubing for use as a portable pipe line with standard mechanical couplings is available. The tubing is suitable for use in the petroleum, mining, construction and processing industries, for air, vacuum, paint and water supply. Steel & Tubes Div. of Republic Steel Corp., 224 E. 131 St., Cleveland 8, Ohio.

Bituminous spreader—A four-page illustrated bulletin shows how two models of a bituminous maintenance distributor operate on a standard truck. The two included are the 1,000 and 800 gal models. Operational spraybar equipment also is discussed. In addition, the bulletin illustrates a road sweeper, compaction roller, asphalt kettle and maintenance unit. Complete specifications are included in the brochure. Rosco Manufacturing Co., Minneapolis, Minn.

Sewage disposal—A 12 page brochure explains in non-technical language where the Cavitator is used and how it works. Typical applications of the air operated waste treatment unit include subdivisions, motels, resorts and schools. Catalog 100. Yeomans Brothers Co., Dept. S, Melrose Park, Ill.

Aluminum—New 110 page Alcoa Architectural Stocks Catalog with installation details, procedures and specifications, as well as available products, has been published. Aluminum Company of America, 1501 Alcoa Building, Pittsburgh 19, Pa.

Control systems—A four-page bulletin (No. 500) describes the purpose, design and operation of Bailey metering and control systems. Included is a discussion of pneumatic and electric telemetering, and pneumatic control, along with references for products making up these systems. Bailey Meter Co., 1050 Ivanhoe Road, Cleveland 10, Ohio.

Pipe insulation—A slide "Fact Finder" for pipe insulation is available free. It selects the most economical thickness of pipe insulation, gives the insulation surface temperature and the Btu loss per lin. ft per hr for various insulation thicknesses on pipe ranging from 1 in. to 24 in. in dia. where pipe temperature is 300 F. to 1200 F. The slide finder is durably plastic coated. Union Asbestos & Rubber Co., 1111 W. Perry St., Bloomington, Ill.

Grit collecting—A 28 page book, illustrated, tab indexed, and hole punched contains design data on seven types of grit collectors, two grit washers, and the Tritor screen. Detail drawings and specifications are included to assist in the preparation of drawings and specifications. The designs include velocity controlled chambers for shallow or deep chambers, chambers with dewatering and washing screws or inclined plane dewatering troughs. "Grit Collecting and Grit Washing Equipment," Book 2571. Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.

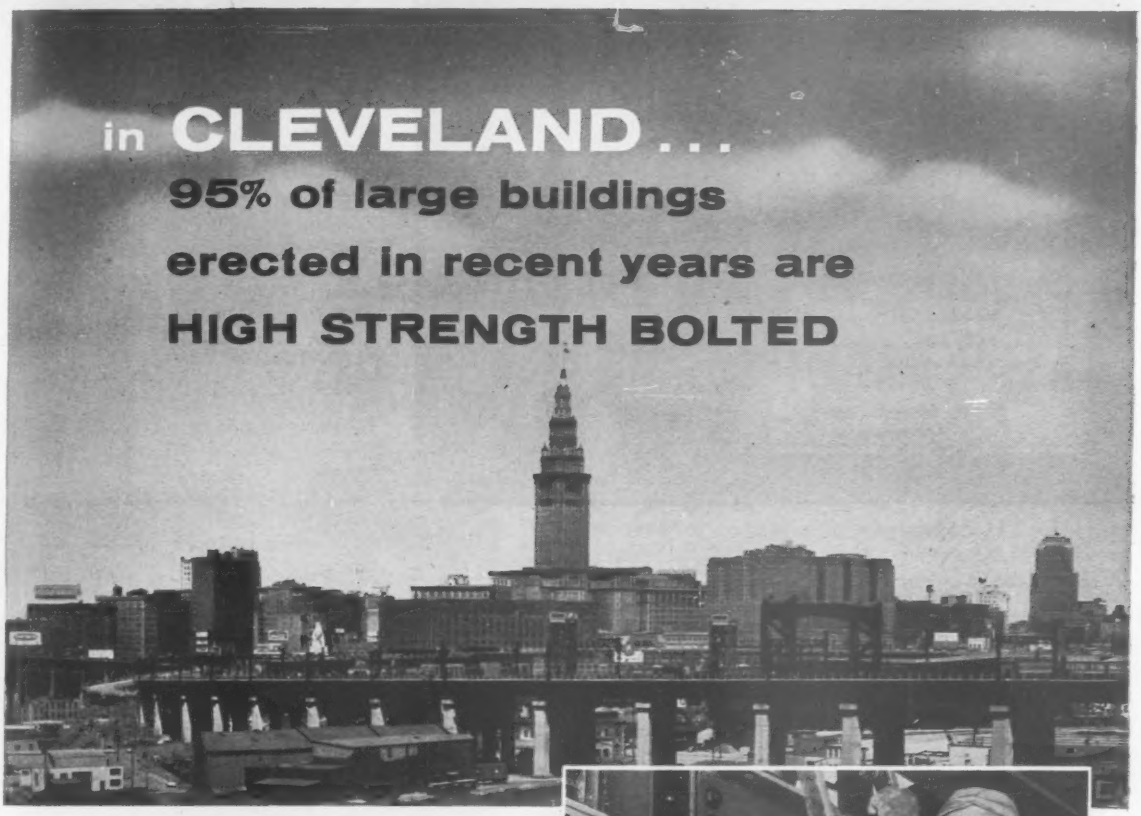
Asphalt additives—How asphalt antistripping additives can be applied in all kinds of weather is described in a new booklet titled "Redicoate". Being of use to both contractors and engineers, the pamphlet covers the use of Redicote in liquid asphalts and asphaltic cements. Based on new research and field data, the pamphlet explains how the asphalt-to-aggregate bond is increased by its use. Armour Chemical Div., Derivatives Department, 1355 W. 31st St., Chicago, Ill.

Derricks—A three-page folder for steel erectors illustrates how to raise a guy derrick from floor to floor on a building-construction project without using other lifting equipment. American Hoist and Derrick Co., 63 South Robert, St. Paul, Minn.

Refractory Mortars—Six-page bulletin No. 600 covers Technical data on maximum-use temperatures, fusion types of set, form, pounds required per 1,000 brick for trowelling, dipping and brush-coating, and gallons of water required to trowel and dip the mortars. J. H. France Refractories Co., 1944 France Road, Snow Shoe, Pa.

Glass blocks—A 32 page catalog about the new uses of glass blocks includes information on light transmission, insulation values, accessory materials and specifications. There are seven pages of elevations and sections of typcial glass block panels. Ask for booklet GB-108. Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.

BOLTED CONSTRUCTION IS "GOING UP" EVERYWHERE



CLEVELAND, too, endorses the advantages of high strength bolting in erecting steel frame structures. Ninety-five per cent of the large buildings that have gone up during the past few years, including the Fairview and Cleveland Clinic hospitals, are tied together with high tensile bolts.

Almost everybody prefers this advanced construction technique to riveting. Engineers like it because bolted joints are stronger and stay tight permanently. Contractors find the speed of fastening chops construction costs. Ironworkers are rid of the danger of hot rivets. Neighbors appreciate the quiet.

RB&W . . . largest independent producer of high strength bolts for construction

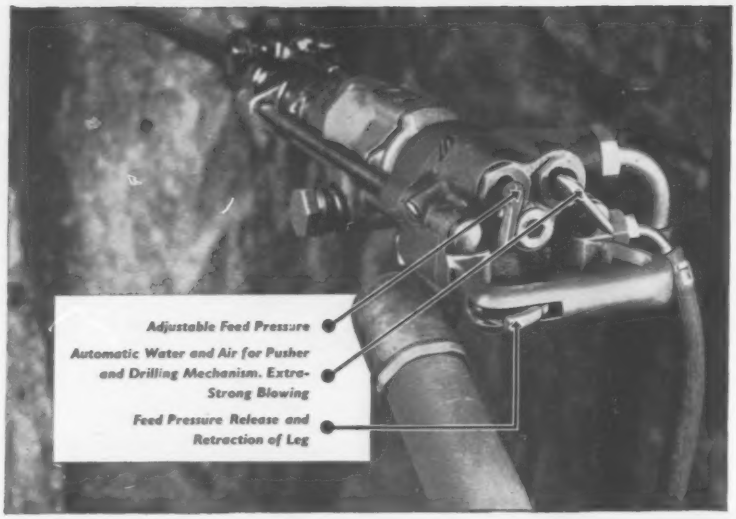
RB&W high tensile bolts have been a key element in the overwhelming approval of this construction method. They provide connections with high shear and tensile strength . . . stay permanently tight under *all* kinds of loads. These high quality fasteners conform to ASTM specification A325, assuring absolute reliability in joining buildings, bridges and equipment.

For more details, look up the RB&W Catalog in Sweet's Industrial Construction File, or write for copies of this informative bulletin. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N.Y.

Even with a minimum of experience two-man crews tighten bolts expertly and fast, cutting weeks from frame erection time.

RB&W
113th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors** from coast to coast.


Adjustable Feed Pressure
Automatic Water and Air for Pusher and Drilling Mechanism. Extra-Strong Blowing
Feed Pressure Release and Retraction of Leg

THE NEW

ATLAS COPCO LION

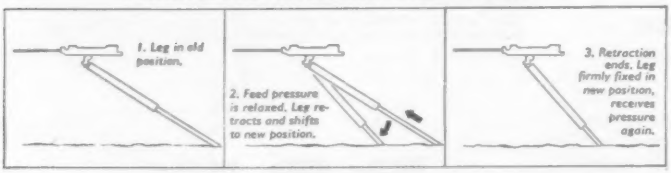
the most remarkable heavy-duty pusher-leg drill on the market

The Lion is the only rock drill with retractable leg operated from the backhead, which means quicker repositioning. It is also one of the very few drills on the market with all the operating valves controlled by one hand. Both these features make for great savings in time and manpower: in addition, the Lion has an especially high drilling speed compared with other drills in the same class.

THE RIGHT STEELS FOR THE LION

With the Lion choose Sandvik Coromant tungsten-carbide-tipped integral steels—the most widely used in the world—or Sandvik Coromant detachable bits and extension steel equipment.

PUSHER LEG ADVANCES WITH DRILL IN ACTION


1. Leg in old position.
2. Feed pressure is relaxed. Leg retracts and shifts to new position.
3. Retraction ends. Leg firmly fixed in new position, receives pressure again.

Write, phone or cable today for further details to any of the addresses below:—

Atlas Copco

ATLAS COPCO EASTERN, INC., P.O. Box 2568, Paterson 25, N.J. Phone Armory 4-3310
ATLAS COPCO PACIFIC INC., 930 Brittan Ave., San Carlos, Calif. Phone Lytell 1-0375
ATLAS COPCO CANADA LTD., Montreal Airport, Quebec. Phone Melrose 1-5571
ATLAS COPCO MEXICANA S.A., Apartado Postal 56, Torreon, Coahuila. Phone 39-07

Books

Electrical Costs

ELECTRICAL CONSTRUCTION COST MANUAL—By Ralph E. Johnson. 431 pp. McGraw-Hill Book Co., New York, Toronto, London. $10.

Though intended principally for electrical engineers and contractors, this book also will be useful to others concerned with the cost of electrical installations in buildings.

The author proposes an estimating method based on unit assemblies. This makes necessary establishment of a code to identify each assembly, such as boxes, conduit, fixtures and ducts, and setting up of installation standards.

The code adopted in this book contains 10 digits for each item. The first two digits identify the item; the third is descriptive (rigid, flexible, for instance); the next four indicate such detail as number and size of wire, box or duct; the eighth describes the type of construction (in free air, exposed on concrete, etc.) and the last two provide additional dimensional data.

Tables present material and labor costs for numerous unit assemblies listed by code number.

Materials and methods to be used in making various types of installations are shown in 172 standards for typical assemblies. Labor units in hours for each item are given on the drawings.

"When a job is estimated by unit assemblies, and the bid is successful," the author says, "it becomes a simple matter to indicate the drawing number on either the shop working drawings or with red pencil on the architect's print—thus indicating to the electrician in the field a reference to the exact details and procedure which he should follow in making the installation."

As pointed out in a chapter in which estimating procedure is discussed in detail counting groups or assemblies of items instead of individual items speed up the time-consuming process of estimating.

Miscellaneous Notes

LETTER SYMBOLS FOR HEAT AND THERMODYNAMICS—ASA Y10.4–1957. American Society of Mechanical Engineers, 29 W. 39th St., New York 18. $1.50.

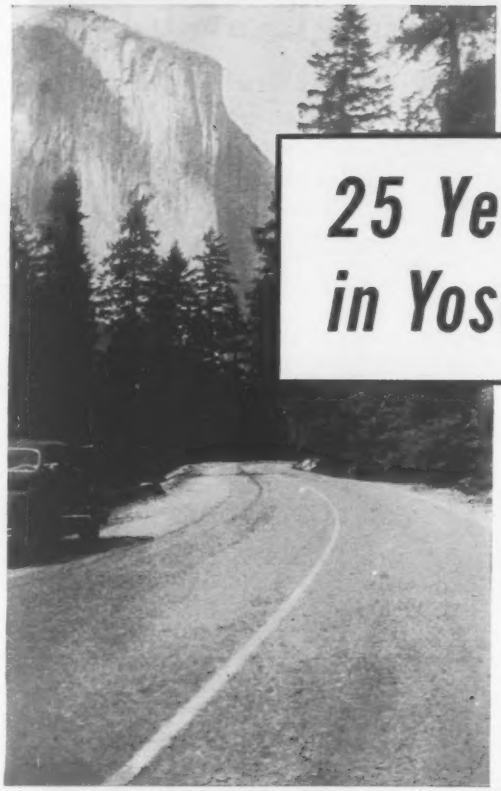
ENGINEERING COLLEGE RESEARCH REVIEW—1957—408 pp. Engineering College Research Council, University Heights, New York 53. $2.00

ROADS, RAILS & WATERWAYS—by Forest G. Hill. 248 pp. University of Oklahoma Press. Norman, Okla. $4.00.

ADVANCED DYNAMICS—by John E. Younger. 285 pp. Ronald Press Co., 15 E. 26th St., New York 10. $8.50.

BITUMULS SURFACE TREATMENTS ARE REAL LIFE SAVERS*

25 Years of Good Roads in Yosemite National Park



1933: Heavy-duty pavements of Bitumuls Penetration Macadam.

*By permission of Beech-Nut Life Savers, Inc., for candies

Just over 25 years ago, engineers of Yosemite National Park prepared for an expanded program of road surfacing. Located far from any hot-mix plants, they specified the then-new Bitumuls® Penetration Macadam type of construction.

This sound pavement provided excellent service, even in areas where snow, ice, and rigorous weather prevail for many months of the year. These roads in Yosemite are now open the year-around for winter sports enthusiasts.

With the improved road system, visitors came to the Park by hundreds of thousands. As a result of this heavier-than-anticipated traffic, combined with the severe weather, the need for an organized maintenance program became obvious. That's when the Park Engineers turned to Bitumuls Surface Treatment as a proved "life saving" maintenance tool.

1948: For 15 years, occasional Bitumuls Surface Treatments have kept pavements in top shape.

1957: Newly-introduced Bitumuls Slurry Seal also used for road and walk maintenance.

Bitumuls Surface Treatments not only successfully extended the life of the pavements, but also provided all-year, skid-proof, safe surfaces.

In 1957, Park officials employed another American Bitumuls development known as "Bitumuls Slurry Seal." This new technique is a very economical "life saver." It performs a "holding action" against weathering and further deterioration, permitting continued use of the pavement ahead of planned resurfacing.

American Bitumuls & Asphalt Company

320 Market St., San Francisco 20, California

Baltimore 3, Md. · Mobile, Ala. · Inglewood, Calif. · St. Louis 17, Mo. · San Juan 23, P. R. · Oakland 1, Calif. · Perth Amboy, N. J. · Cincinnati 38, Ohio · Tucson, Ariz. · Portland 8, Ore.

Call our nearest Bitumuls office for details on these paving and maintenance techniques, and for the "Bitumuls/Life Saver" story.

Maine Interstate Highway Job

Contracts for main line and industrial spur includes three bridges, ramps and dual highway

This $2,743,282 contract calls for three steel bridges, 2.640 miles of paved ramps and 2.478 miles of bituminous concrete dual highways on the main line interstate and industrial spur at Bangor, Maine.

The State Highway Commission award to J. R. Cianchette is 2.4% below the second and 15.7% below the high of four bids.

Clarkeson Engineering Co., Boston, Mass. is the consultant.

Concrete is specified AASHO.

The contractor furnishes all materials. Rail and truck transportation are accessible to the site, and the railroad is one mile away.

Minimum wages on this job range from a high of $2.00 for skilled, through $1.75 for semi-skilled, to $1.25 for common labor.

1C J. R. Cianchette, Pittsfield, Me	$2,743,282
2 Bridge Constr. Corp., Augusta, Me	2,810,557
4 Lane Constr. Co., Meriden, Conn	3,252,646

Bids: Items 11-13-57	Unit	Quantity	Unit Prices 1C	2
Clearing	ac	75	$350.00	$325.00
Remove trees, 9"-24"	ea	15	60.00	30.00
over 24"	ea	10	100.00	80.00
Exc, earth	cy	675,000	0.40	0.60
struct, drainage	cy	32,000	1.50	1.70
abuts & retain walls	cy	1,000	1.80	3.00
piers	cy	1,400	1.80	3.00
rock	cy	67,000	2.15	0.60
drainage	cy	300	12.00	16.00
Borrow, granular	cy	102,000	0.70	0.65
for bri fndns	cy	500	1.80	0.01
Bulldoze grading, incl oper	hr	200	11.00	8.00
Base crse, gr, in pl meas	cy	177,000	0.85	0.90
screen	cy	45,000	0.35	0.10
crushed	cy	67,000	1.35	1.40
bit macadam	t	35,000	4.55	4.00
Overhaul, in pl meas	ym	1,020,000	0.10	0.10
pit meas	ym	306,000	0.08	0.08
Stripping pits	cy	20,000	0.05	0.30
Sprinkling	U	300	5.50	6.00
Calcium chloride	t	200	70.00	65.00
Stone chips	t	100	7.00	6.00
Surf crse, bit macadam	t	5,700	5.15	4.50
conc, tp A	t	26,100	6.65	7.00
Road tar	gal	5,000	0.35	0.28
Asph cement	gal	280,000	0.165	0.16
emuls, quick setting	gal	95,000	0.16	0.17
Tack coat	gal	200	0.50	0.40
Membr waterproofing, 3 ply	sy	4,000	2.40	2.50
Asph ctd CMP, 15"	lf	1,120	3.75	4.00
18"	lf	40	4.50	4.75
24"	lf	780	6.50	6.50
30"	lf	10	8.50	9.50
36"	lf	510	13.50	12.50
60"	lf	100	28.00	30.00
54", 8 gage	lf	160	35.00	33.00
60",	lf	50	40.00	30.00
metal bands, 15"x6"	ea	25	45.00	40.00
conn bands, 15"x2"	ea	60	40.00	35.00
RCP, 15"	lf	3,200	3.25	3.50
18"	lf	560	4.50	5.00
24"	lf	1,500	6.50	7.00
30"	lf	180	9.00	7.50
36"	lf	690	12.50	12.00
24" ES	lf	420	7.75	8.00
36"	lf	180	13.50	12.00
54"	lf	270	27.00	24.50
60"	lf	240	35.00	29.50
VCP, 6"	lf	200	1.50	1.00
8"	lf	400	2.00	1.50
12"	lf	200	3.00	2.50
18" ES	lf	2,430	7.00	7.25
Drop inlet, tp A	lf	1	250.00	275.00
B	lf	1	275.00	300.00
MH, tp A	ea	6	325.00	250.00
Catch basins, mod tp A	ea	9	275.00	275.00
F	ea	23	290.00	275.00
G	ea	17	300.00	275.00
MH, City of Bangor standard	ea	1	320.00	300.00
54" sewer reloc, remodel	ea	1	200.00	300.00
18" sanitary sewer	ea	10	500.00	275.00
special for 54" pipe	ea	5	525.00	550.00
Abandon DI, CB or MH	ea	42	50.00	50.00
Catch basins, mod tp C	ea	64	290.00	320.00
Traps, 15"	ea	5	60.00	75.00
Underdrain, tp B	lf	900	2.00	2.50
C, 12"	lf	3,900	3.25	4.00
15"	lf	2,870	4.00	4.50
18"	lf	1,390	4.75	5.50
outlets	lf	90	2.00	1.50
Met endwalls for pips, 24"	ea	16	60.00	60.00
30"	ea	1	85.00	85.00
36"	ea	8	125.00	125.00
Abandon exist 18" sewer	ls	job	1,500	600.00
trunk sewer	ls	job	8,500	4,000
CSP, reinf, 84"	lf	1,140	23.00	24.00
Port cem	bbl	5,950	6.00	6.70
Conc, abuts & retain walls	cy	1,030	30.00	34.00
piers	cy	1,220	35.00	37.00
rdwy & sidewalk slabs, stl bri	cy	1,460	47.00	63.00
culv end walls	cy	30	55.00	00.00
encase SP	cy	120	40.00	40.00
exist reinf 18"	cy	140	11.00	20.00
54"	cy	20	30.00	30.00
Steel, struct, f&d	lb	1,183,000	0.1425	0.14
e	lb	1,183,000	0.02	0.02
reinf, d	lb	486,000	0.11	0.12
e	lb	486,000	0.025	0.04
Bridge drainage				
Indus spur over avenue	ls	job	4,000	6,500
Hwy #80 over indus spur	ls	job	6,000	8,500
street over Hwy 80	ls	job	3,000	6,500
Shear connects, d&p				
Hwy 80 over indus spur	ls	job	2,200	2,700
Street over Hwy 80	ls	job	1,500	1,800
Pile load test				
Indus spur over avenue	ls	job	1,200	1,600
Hwy 80 over indus spur	ls	job	1,200	1,600
Conc piles, cip	lf	7,700	7.50	6.00
Drains, French	cy	720	3.50	4.00
cut slope	lf	3,400	0.75	3.00
Aluminum railing	lf	1,360	7.00	7.50
Granite curb, tp I	lf	4,000	4.50	4.20
circular	lf	340	6.75	6.00
sloped	lf	33,200	7.00	7.00
circular	lf	520	13.50	13.50
6"x7"	lf	240	8.50	9.00
transition sections	ea	23	50.00	48.00
edging, circular	lf	190	7.00	18.00
Conc pav medians & islands	sy	1,380	5.00	5.00
Gd rail, tp E	lf	11,500	2.90	2.60
dble face	lf	1,600	5.00	4.35
barrier ends	ea	3	15.00	5.00
term sect	ea	4	10.00	3.00
anchor, remove & stack	ea	8	15.00	10.00
End wings	ea	82	6.00	6.00
Guard posts, tp B	ea	50	9.00	7.50
Fence, metal posts	lf	22,000	0.60	0.48
stock, remove & stack	lf	4,900	0.20	0.20
Riprap, hand laid	cy	100	10.00	12.00
Excavation, loam	cy	26,000	2.25	2.25
Borrow, loam	cy	8,000	2.40	2.00
Sodding	sy	26,000	0.95	1.00
Seeding, Parkway mixture	U	2,900	8.00	11.00
Mulch, hay	t	320	40.00	50.00
Project markers	ea	4	25.00	25.00
Right of way monuments	ea	50	14.00	14.50
remove & reset	ea	12	10.00	14.50
Underdrain outlet marker	ea	1	10.00	10.00
Traffic officers	mh	6,000	1.50	1.50
Bldg., raze & remove	ea	1	500.00	100.00
	ea	2	100.00	100.00
	ea	3	50.00	100.00
	ea	7	250.00	100.00
	ea	1	750.00	100.00
	ea	1	350.00	100.00
	ea	1	1,350	100.00
Light standards, alum	ea	77	265.00	250.00
bases	ea	77	60.00	55.00
Junction boxes	ea	45	100.00	85.00
Cond, bit fiber, tp II 3"	lf	12,000	0.55	0.60
galv stl, 2"	lf	500	1.30	1.50
3"	lf	2,800	2.90	2.50
Fence, chain link, 72"	lf	3,400	4.50	3.25
Barricade, portable	ea	16	125.00	100.00
flashing lts	ea	7	250.00	200.00
Granite edge, remov & reset	lf	5,100	1.60	2.00
stack	lf	3,800	1.00	1.25
curb, remov & reset	lf	2,100	2.00	2.00
Slope paving for bridge	sy	2,200	6.25	6.00

d deliver e erect f fabricate

Commence: Dec. '57

Completion schedule: 260 working days

Liquidated damages: $150/day

In the field of

HYDRAULIC DREDGING

GAHAGAN

a leading name for over 50 years

Gahagan Dredging Corporation,
90 Broad St., New York 4, N. Y.
Write, wire or phone Whitehall
3-2558. Cable "Walgahagan".

HOW WE CUT PRODUCTION TIME IN HALF

By a Stow Vibrating Screed Owner

Our contract called for us to finish a number of bridge decks on the Massachusetts Turnpike. We needed to strike off our concrete decks fast and yet produce just the right crown.

After seeing the fine results obtained by another contractor, who was using Stow Vibrating Screeds for a similar job, we decided to buy Stow Screeds ourselves. Specifications of the crown we required were given to Stow; we received the screed beam with the crown built right in.

We were highly commended by the Turnpike Commission for the fine job the Stow Screeds did. We were able to cut production time on these decks almost in half, because we found that Stow Screeds strike off STIFF concrete smooth and true to grade.

This story is typical. Stow Screeds have been used all over the world for striking off concrete on bridge decks, short sections of highways, prestressed panels and floors. Stow Screeds are available complete with beam, or in the new Stow package assembly, containing everything but the beam. For complete information on Stow Vibrating Screeds, contact your nearest Stow distributor, listed in the yellow pages of your telephone book under "Concrete Vibrators", or write

STOW Manufacturing Co.

19 Shear St., Binghamton, N. Y.

Tru-Stop Brakes

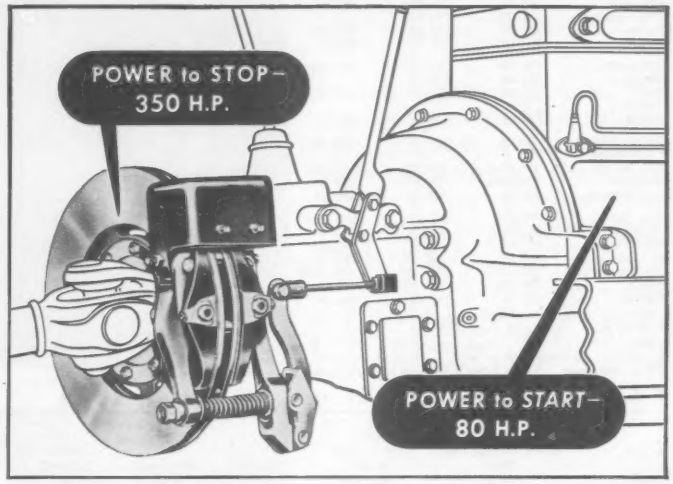
Meet Every Heavy-Duty Safety Requirement

OFFER POSITIVE PROTECTION AGAINST RUNAWAY OR PARKING ACCIDENTS—AT LOWEST COST

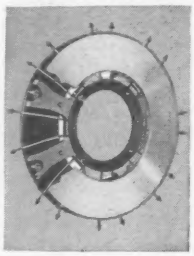
HERE IS WHY:

They have surplus power required for emergency service—no dangerous self-energizing

TRU-STOP Heavy-Duty Emergency Brakes are not only excellent parking brakes. They serve as a complete, independent and fully reliable braking system. Operating on the propeller shaft they enable the driver to continue on safely in the event of service brake failure. TRU-STOP brakes have the surplus braking capacity to be used *repeatedly* as an auxiliary to service brakes.

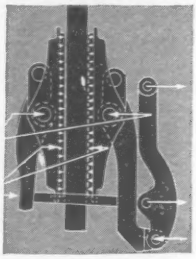


Brakes actually do more work than the engine in terms of horsepower Where it takes 80 HP to accelerate to 20 miles per hour, it takes 350 HP to make a safe stop from 20 miles per hour within required limits



Ventilated to throw off heat

Brake efficiency depends on ability to throw off intense heat —rapidly. Discs of TRU-STOP brakes are exposed to the air even during the braking operation. Ventilated design circulates air *between* the disc plates.



Give uniform brake pressure

Disc of TRU-STOP brakes is "squeezed" between the flat surface of the shoes. Effort applied to brake lever operates front and rear lever arms simultaneously. Pressure is exerted on the center of each shoe. Entire lining surface is in contact.

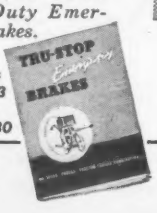
FOR SAFE, ECONOMICAL, HEAVY-DUTY BRAKING WITH MAXIMUM LIFE AND MINIMUM MAINTENANCE

TRU-STOP Brakes are used on a great variety of mobile and stationary equipment

SUCH AS—

- Motor cranes
- Road rollers
- Dump trucks
- Power dividers
- Cooling tower fans
- Oil well pumps
- Cold header presses
- Scrubbing machines
- Wire rope stranders
- Fork lift trucks
- Motor scrapers
- Tractors
- Graders
- Diamond core drills
- Electric locomotives
- Oil well servicing rigs
- Railway inspection cars
- Shapers
- Power take-offs
- Winches
- Motor shovels
- Tractor loaders
- Conveyors
- Hard rock drill positioners
- Mine locomotives
- Power presses
- Railway power ballisters
- Cable tool spudders
- Aerial tram cars
- Tension wire stringers

We will be glad to answer any questions or give you more detailed information about TRU-STOP Heavy Duty Emergency Brakes. Send for Catalogs DH-33 and DH-530



Automotive and Aircraft Division
AMERICAN CHAIN & CABLE

601 Stephenson Building, Detroit 2
2216 S. Garfield Street, Los Angeles 22 • Bridgeport 2, Conn.

ACCO

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate Ready-mixed Concrete, Asphalt: Last, Mar. 6; Next, Apr. 10
- Iron and Steel Products, pipe: Last, Mar. 13; Next, Apr. 17
- Wage Rates, Building Board, Lath, Insulation: Last, Feb. 27; Next, Apr. 3
- Wood Products, Glass Explosives, Chemicals: Last, Mar. 20; Next, Apr. 24

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper, Carload lot, Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$149.90p	$149.90p	$290.80p	$334.55p	.....	.....	$30.50p	$32.70p	$23.50	$24.50	$.....
Baltimore	205.00	217.00	408.00	495.50	596.00	661.00	36.00k	41.00k	23.00	22.00	.....
Birmingham	135.00y	152.00p	.....	303.00p	376.00p	465.00p	27.00ff	38.00y	35.02	22.30	26.32y
Boston	232.00†	248.00†	463.25†	556.00†	.....	.....	41.50p	46.50p	30.20†	31.20†	.....
Chicago	136.00	145.00	280.00	.....	.....	.....	30.00	32.00	38.00	35.20a	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00y	288.00j	314.00j	48.75ij	47.00ij	30.04j	26.04j	30.04j
Cleveland	209.00	223.00	.....	475.00	.....	.....	38.00	46.00pp	31.00	25.00	.....
Dallas	182.00	182.00	360.00	364.80	448.25	582.80	26.75	45.25	41.80	24.58	29.50
Denver	.....	.....	.....	.....	.....	.....	31.50	49.50	46.00p	42.00p	46.00p
Detroit	272.00	298.00	545.00	.....	662.00	755.00	47.50p	48.00p	38.00	30.00	.....
Kansas City	188.00	188.00	312.00	312.00	400.00	500.00	33.00	33.00	36.28	34.28	29.76
Los Angeles	r	r	r	r	r	r	32.50j	.....	38.00	38.00	39.00
Minneapolis	188.00p	210.00p	429.00p	210.00pu	.....	.....	48.00rp	52.50y	47.00bbe	37.00bbe	49.00bbde
Montreal	170.00au	178.00au	328.00au	270.00y	400.00y	.....	48.25b	56.30b	39.00	22.00	13.25
New Orleans	188.00	188.00	380.00	380.00	.....	.....	40.00	55.00	44.00	33.00	33.00P
New York	175.30h	197.0h	280.40ah	283.00hn	.....	.....	44.00	.....	38.00	35.00	.....
Philadelphia	189.00	189.20	337.90	405.00	.....	.....	30/34	38/42	27.60	26.60	8.17m
Pittsburgh	147.50r	157.75r	295.00r	335.00r	435.00r	500.00r	39.00r	46.00r	36.00r	31.00r	.....
St. Louis	178.80	185.00p	391.00p	401.00p	459.00	521.50	43.00r	41.50	0.95aa	.80aa	1.25aa
San Francisco	186.85*	177.10*	238.30dd*	.....	.....	.....	43.00*	43.00*	28.90	28.90	31.00 *n
Seattle	235.00p	270.00p	490.00p	285.00pw	.....	.....	48.00	62.00	52.00bb	38.00bb	4.50mbb
Toronto	146.00	157.00	280.00	234.00f	305.00	.....	35.00	63.00	36.00	33.50	31.50

*§ F.o.b. Yard. **† F.o.b. plant Stockton. *† F.o.b. yard Roxbury. *n Smooth. lots. *q Provincial and Municipal tax extra. *r Not used: earthquake danger. *s $4.50 del. *t 8 x 12 x 12 in.-3 cell. *d Pulverized hot. *e 8"; 10th following month. *f 8 x 8 x 12 *g Lumps, $26.72. *h F.o.b. trucks, job site N.Y.C *i 60 lb sacks. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. processed. *n 7¾ x 7¾ x 12. *o Mason's double hydrated pressure. *p Truck 8 x 16 x 12. *t 2% cash. *u Incl. Federal tax. *v Sand lime. *w 5 x 8 x 12. *y Chi common. *z Pebble: 80 lb sack. *aa 50 lb sack. *bb LCL. *dd 6 x 12 x 12. *ff 80% common. *gg Smooth. $51.50 Rough.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases In oil a	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 65-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 300 lb. bbl. per ton
Atlanta	$16.50	$30.125	$3.80	$3.80	$3.81	$3.39	$2.20	$2.62	$0.67	$57.75
Baltimore	16.25	29.75	3.00	4.40	3.60	2.78	4.25	4.25	.48	60.18
Birmingham	16.50	30.125	3.90	3.40	.....	3.00	2.20ii	2.20ii	.82ff	45.00ee
Boston	16.25	29.75	.....	.....	.....	3.63g q	2.83g	2.83g	.50g	58.00g
Chicago	16.25	29.75	.....	.. .	...	3.60ls	2.98ls	2.98ls	48.00ibb	57.70l
Cincinnati	16.25	29.75	.....	.....	.....	3.13	2.70	2.73	.428y	55.96
Cleveland	16.25	29.75	2.80pgg	2.63ggR	2.94zz	3.73q	2.85o	2.85	.501y	49.00gg
Dallas	16.50	30.50	..	3.20R		2.95s	2.95o	2.95o	.464	65.00hh
Denver	16.75	30.25	3.98	3.20	3.70	2.63	2.35o	2.40o	.489	50.00
Detroit	16.25	29.75	2.70	3.95	2.70	3.30	2.54f	2.40gf	582ff	47.30
Kansas City	16.25	30.50	3.99	3.43	3.01	2.72ii	1.82y	1.82y	.54y	.....
Los Angeles	16.25	30.00	3.30n	4.60n	4.20n	2.20n	2.15nii	i	.70nn	i
Minneapolis	16.25	29.88/29.75	.....	.....	.....	2.90	2.414i	2.414i	.442i	50.00r
Montreal	.....	.....	5.02Dft	5.04zft	4.86zft	5.40	4.05f	4.05f	1.60	....
New Orleans	.....	.....	....	....	....	3.06	2.29	2.85	0.680	.....
New York	15.25f	29.75	.....	.....	.....	3.19	2.45o	2.45o	.425s	49.00*
Philadelphia	16.25	29.75	3.60	3.40/3.65	3.50/4.00	3.00/3.30	2.54o	2.54o	.37/.45	48/54
Pittsburgh	16.25	29.75	2.20fF	2.25fF	2.25fG	3.37s	2.50s	.....	.45	.....
St. Louis	16.25	29.75	.....	.....	.....	3.70iis	2.75kk	2.75kk	.46ij	64.00
San Francisco	16.25	30.00	3.20	4.30	3.58	2.85	1.97aa	3.10	.475jj	54.00
Seattle	16.25	30.25	3.47	4.19ee		3.82gg	3.30kee	....	.50ee	51.40ee
Toronto	.....	...	5.00	5.75	5.80	5.40	4.15r	3.30s	1.70j	62.00A

*t Delivered. * Note: Red lead in oil 50% higher than white lead in oil. ** Aver. wt. approx. 425 to 550 lb drums. *a Red lead prices change frequently due to olo lead price changes. *b U.S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lbs. *f Per 432 sq ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload prices, Minneapolis and vicinity. *j 45 gal containers. *k Over 80% ferric oxide. *l Not used. *m F.o.b. city. *n Per 60 lb roll. *o 5-drum, 50 gal each. *q Per 50-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Incl. Federal tax. *u Per 30-lb square. *v Per ton. *w Price to contractors $1.25 less. *x Ready-mixed. *y 55-gal container. *z Drums. *aa 15 lb. sq ft. roll. *bb Roofers coating and cement. *cc LCL, truck delivery. *dd Asphalt pitch in 100 lb package. *ff 5-gal drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per 100 lb. Asbestos roof coating. *jj Asbestos roof coating. *kk 400 lb barrels. *ll ASTM Spec. D962-49. *mm Mill. spec.: E TTP27; F TTV81; G TTP31. *nn Std. black. *oo Not quoted after Oct. 1957 *pp Not revised.

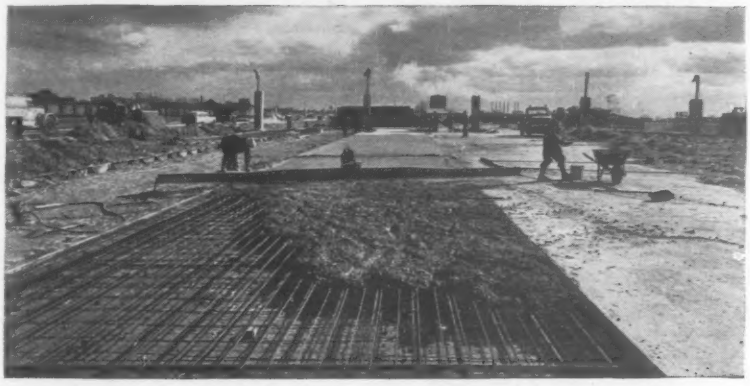
PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡ Neat per ton	PLASTER‡ Gauging per ton	VERMICULITE‡ Home Insulation pellets	VERMICULITE‡ Plaster aggregate	VERMICULITE‡ Concrete Aggregate Untreated	PERLITE‡ Plaster Aggregate	PERLITE‡ Concrete Aggregate Untreated	ALUMINUM SHEET†† Flat .102" th 36"x96" & 48"x144" per lb/ft	ALUMINUM SHEET†† Corr roof .032" th 35"x12' per sht	STAINLESS STEEL† SHEET-TYPE 302g 20 ga 48"x96–120" per cwtbh	STAINLESS STEEL† SHEET-TYPE 302g 28 ga 36"x120" per cwtmm	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ¾"b	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ¾"a
			per bag of 4 cu ft										
Atlanta	$31.00	$36.00	$1.55r	$1.65r	$1.80d	$1.65	$1.65	$0.422n	$8.97n	$61.44n	$67.50	$16.74f	$23.41f
Baltimore	23.25	33.65	0.95	1.15	1.15	1.15	1.65	0.431	0.489r	56.25	64.25	0.1674	0.2341
Birmingham	33.00	39.00	1.55	1.55	1.80f	1.65	1.55l	0.466	10.48	67.34	76.09	0.1608	0.2244
Boston	22.00	30.00	1.40	1.40	1.45	1.45	1.80	0.466	30.10p	65.42ddf	71.92ddff	0.1562	0.2176
Chicago	26.80	26.80	1.55	1.60	1.60l	1.60	1.60	0.506z	10.376a	65.15aee	73.90aee	0.1562	0.2176
Cincinnati	28.00*	28.00*	1.75	1.75	1.75	1.85	1.90	0.434	9.56	65.28	74.03ff	0.1608	0.2244
Cleveland	26.50	44.70	1.13k	1.166j	1.24l	1.45	1.45	0.506aa	8.66	65.33aa	74.06oo	15.62f	21.67f
Dallas	30.00	32.00	1.05	1.21	1.33	1.21	1.32	0.474	0.510r	66.59	80.00	0.16	0.2240
Denver	25.00	25.00	1.50	1.40	1.50	1.40	1.55	0.462	10.37	66.30gg	75.05gg	0.1825	25.46
Detroit	25.00	25.00	1.29	1.32	1.41	1.40	1.45k	0.456a	10.376a	65.15a	73.90a	12.78f	21.76f
Kansas City	30.00	35.00	1.14	1.18	1.24l	1.18	.....	0.444	11.40	67.50	76.25	15.62f	21.76f
Los Angeles	26.00	27.00	1.25k	1.20k	1.25	1.10	1.10	0.506	10.543d	67.10	75.85	0.1562	0.2176
Minneapolis	35.00	35.00	1.55	1.70	1.90	1.40	1.40	0.503	15.15w	65.71	72.21ff	0.15.62f	0.21.76f
Montreal	27.60h	35.60h	1.20	1.40	1.50	1.15v	1.15v	0.437	9.92	66.50	.....	0.1827	0.2160
New Orleans	32.00	45.00	1.25	1.25	1.25	1.25	1.25	0.444	8.796	68.00	76.00	0.1608	0.2244
New York	24.20	30.20	1.35	1.30	1.50	1.40	1.40	0.506a	10.14ad	68.58	77.33	16.08f	22.44f
Philadelphia	23/25	32.00	1.35	1.35	1.40l	1.05	1.05	0.44aw	9.46a	66/68a	75/77a	20.00f	28.75f
Pittsburgh	30.00nn	33.00nn	1.60nn	1.50nn	1.35	1.73	1.73	0.456	9.83	64.06	76.25ppR	0.1419	0.1980
St. Louis	29.00	40.00	1.35	1.60jj	1.50	1.60	1.60	0.456	10.37	68.11	74.61y	16.08fm	22.44fm
San Francisco	27.85	32.00	1.20	1.20	1.30	1.20o	1.30o	0.506	9.13	67.10	75.85	0.1562	.2176
Seattle	42.40	45.60	1.55	1.25k	1.85l	1.80k	.....	0.506	10.10	67.08	88.08	0.1562	0.2176
Toronto	28.00	45.50	1.20	1.30	1.45l	.....	1.55	0.4095	24.00ae	73.74	86.52	0.2562	0.3029p

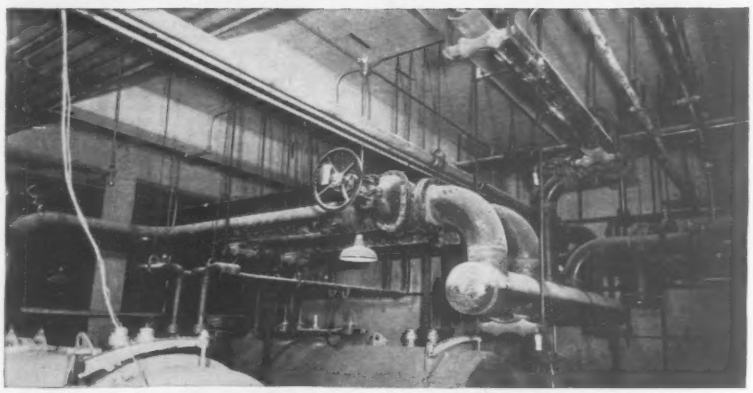
‡trucklots, delivered †fob warehouse *fob city **delivered *b½" O.D. *c ⅝" O.D. *d 0.100"th *e 34" x 60" sheet *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled; 2B finish *h incl. Federal tax *i add 25c for pint of additive *j 1100 & 3003 alloy, mill finish *k bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob mill, r allow *o 250 sacks or more *p 100 sq ft *r per lb. *s 30 lb bag *t 36" x 96;-10.81 lb/sh; 48" x 144": 21.7 lb/sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 100th *y 27 gauge *aa 16M lb & up *dd add $1.00 cwt boxing. *ee 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 60.4-lb, per sh *ii 300-bag lots *jj 100-lb bag *mm Theoretical wt; 19.7-lb per sh. *nn 2% cash *oo skid packed *pp type 304 *R revised.

USS National Pipe used exclusively for snow-melting system on Chicago's Calumet Skyway

Welding together National Steel Pipe sections at the 22-lane toll plaza area, Calumet Skyway, Chicago. The plaza area is equipped with a snow-melting system to reduce winter stopping and starting hazards due to snow and ice.



Embedding the steel pipe grids in concrete. A total of 76,192 feet of National Steel Pipe in sizes of ¾" and 1¼" were used to form the grids of the vast Calumet Skyway snow-melting system.



Under the toll plaza areas, too, boilers supply the heat, through heat exchangers, to the circulating anti-freeze. National Pipe was used exclusively on this application utilizing 2,211 feet of USS National Seamless Steel Pipe.

USS and National are registered trademarks

"The worlds' largest and most experienced manufacturer of tubular products—NATIONAL TUBE"

National Tube Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • United States Steel Export Company, New York

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 31 Connecticut April 1 Massachusetts
April 2, 9 Rhode Island

▲ **Mass., Springfield** — BA 4/15 — City, Bd. Water Comrs., City Hall, Contr. 43, reservoir addn., alterations, incl. two 276x288 ft. rein.-con. rectangular reservoirs, Provin Mountain, Agawam. $3,000,000. Plans deposit $30. Bogert & Childs Engineering Assoc., 145 E. 42 St., New York, N. Y., engrs. CD 10/10.

▲† **Me., Bangor**—MISSILE FACILITY—BA On Or About 4/24—Office of Area Engineer, U. S. Army Engineer Area, 562 Congress St., Portland, constr. missile facility (FY 58) off Burleigh Rd. about 1 mi. east of Rte. 15 and approx. 2½ mi. north of here, ENG-19-016-58-126. Over $10,000,000. Plans deposit $150. CD 12/12.

▲† **Vermont**—BA 5/1—At office Area Engr., U. S. Army Engineer Area, 310 State St., Springfield, Mass., constr. North Hartland Dam and appurtenant structures Ottauquechee River in towns of Hartland and Hartford, Windsor Co., for U. S. Eng., 150 Causeway St., Boston 14, Mass., ENG-19-016-58-60. Over $5,000,000. CD 3/19.

BUILDINGS—BA

▲† **Me., Bangor**—HOUSING—BA 4/10—Procurement Officer, Dow Air Force Base, housing, Dow Air Force Base. $11,000,000. Plans deposit $150. Alonzo J. Harriman, Inc., 292 Court St., Auburn, archt. Sherwood G. Tribou, Wayne, Me., and Whitman & Howard, Inc., 89 Broad St., Boston, Mass., engr. CD 3/12.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
M. DeMattio Constr. Co., 200 Hancock St., Quincy, Mass., CA $7,089,000, est. $8,359,542, Section "P" J. F. Fitzgerald Expressway, Union Park St. to Mass. Ave., FA Proj. No. U-354-(2), Boston. Bids Jan. 28. CD 1/30, under LB.

BUILDINGS—LB & CA

▲ **I. R. Stitch Assocs., Inc.**, 611 New Park Ave., West Hartford, Conn., Owner Builds. $2,835,000. 175 HOUSES "Simsbury Heights", second section, West Point Terrace, TARIFFVILLE, CONN. Elroy Weber, 57 Pearl St., Springfield, Mass., archts. Francis P. Molloy, 10 N. Main St., West Hartford, Conn., engr. CD 3/5.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
April 1 Maryland April 11 Pennsylvania
STREETS AND ROADS
April 1 New Jersey April 11 Pennsylvania

▲† **N. Y., Rome** — AIRPORT FACILITIES — BA On Or About 3/31—U. S. Eng., 111 E. 16 St., New York, Zone 3, constr. apron and taxiway support facilities, Griffiss Air Force Base, ENG-30-075-58-209. $5,000,000-$6,000,000. Plans deposit $75. CD 9/17.

BUILDINGS—BA

▲ **N. Y., New York**—SCHOOL—BA 4/8—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, general constr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures P. S. 150, Fox and Tiffany Sts., Bronx Boro. $2,513,343. Plans deposit $25 on general, $8 each on trades. CD 5/20.

▲ **N. Y., Brooklyn**—SCHOOL—BA 4/15—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, general constr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures P. S. 256, Lafayette and Marcy Aves. and Kosciusko St., Brooklyn Boro. $2,528,000. Plans deposit $25 on general, $10 each on trades. CD 7/23.

▲ **N. Y., New York**—COURTS—BA 4/16—City, Dpt. P. Wks., Municipal Bldg., Zone 7, constr. City and Municipal Courts Bldg., incl. plumbing, heating, ventilating and electrical work Center and White Sts., Manhattan Boro. Plans deposit $100. CD 3/15.

▲ **D. C., Wash.**—DORMITORY—BA 4/15—American University, Massachusetts and Nebraska Aves. N.W., Dormitory "E" Bldg. $1,250,000. Plans deposit $30. Faulkner, Kingsbury & Stenhouse, Ring Bldg., archts. - CD 10/29.

▲ **Del., Wilmington**—SCHOOL—BA After 4/22— Wilmington Bd. P. Educ., 511 W. 8th St., high school. $3,500,000. Whiteside, Moechel, & Carbonell, 909 Tatnall St., archts. Louis H. Doane, Penna R.R. Bldg., engr. CD 3/14/58.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany,
Merritt-Chapman & Scott Corp., 10 Village St. E., Hartford 8, Conn., CA $14,272,510, 5.95 mi. Rye Section of Cross-Westchester Expressway between city of Rye and village of Port Chester, incl. 8.95 mi. local service roads and access ramps, incl. relocation 0.84 mi. Hutchinson River Parkway traffic interchange facilities between Expressway and New England Thruway, structures to carry 6-lane divided expressway and Westchester Ave. eastbound and westbound over relocated Hutchinson River Parkway, Kenilworth Rd. and Purchase St. over Expressway, the Expressway over relocated Westchester Ave. eastbound and Bowman Ave. over the Expressway, The Expressway over Blind Brook, Bowman Ave. over Blind Brook and relocated Ridge and High Sts. and Boston Post Rd. over Expressway, Westchester Co. Bids Oct. 31. CD 11/1, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany, Bids opened 3/13, N. Y.—**Slattery Contg. Co., Inc.**, Maspeth 78, N. Y., LB $4,774,278 est. $5,863,000 (7 bidders), 0.45 mi. 6 lane divided elevated section Cross Bronx Expressway between Clay and Fulton Aves. incl. 1,566 ft. viaduct between Webster and Third Aves. and 0.74 mi. work on various cross streets service roads and access roads, incl. directional signs, lighting, drainage, playgrounds, utilities and roadside development, FICBE 58-2, Bronx Co. CD 2/20, under LB; N. Y.—**Stimm Assocs. Inc.**, 685 Ellicot Square, Buffalo 3, N. Y., LB $5,938,262 est. $6,333,000 (5 bidders), 0.48 mi. four-lane divided thruway, Niagara sect. and 0.3 mi. access roads Wayne and Amherst Sts., Buffalo, FINTC.58-1NTC 58-2, Erie Co., (Correction—contractor). CD 3/14, under LB.

▲ **PENNSYLVANIA**—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg, Bids opened 3/14,
Latrobe Road Constr., Inc., Box 150, Latrobe, Pa. LB $1,294,424 (7 bidders) constr. 23,635 ft. c. conc. variable in width, R.T. 66 Proj. 705-1 Salem and Washington Twps., New Salem Boro, Westmoreland Co. CD 2/26, under State Hy. Dpt. as owner.
Pa.—**Fred W. Ewing, Inc.**, 504 W. Main St., Corry, Pa. LB $1,874,586 (4 bidders) constr. 16,159 ft. divided hy. c. conc. 24 ft. wide each side 56 ft. each divisor, 3 I-beam bridges, L.R. 797 (5) (Proj. 802-1) Fairview and McKean Twps., section of Erie Thruway, Erie Co. CD 2/26.

▲ **PENNSYLVANIA**—Pa. Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,
Adam Eidemiller, Inc., R.D. 4, Greensburg, Pa. CA $3,296,243 conversion 82,645 ft. existing divided hy. to limited access constr. parallel roads 10 bridges T.R. 31, Washington, Fayette and Westmoreland Counties. Bids Feb. 21, awarded Mar. 18. CD 2/27, under LB.

BUILDINGS—LB & CA

▲ **John Oechslin, Inc.**, Commack Rd., Commack, N. Y., CA $2,395,574 (8 bidders), general constr. two ELEMENTARY SCHOOLS and one JUNIOR HIGH SCHOOL, BRENTWOOD, N. Y. Bd. Educ., 3rd Ave., Brentwood, N. Y. Grand Total $3,211,834, Bids Feb. 27, CD 2/13,
L. H. Eggert Co., 36-30 37 St., Long Island City, N. Y., CA $472,060, heating and ventilating (Brentwood, N. Y.);
Geeco Elec. Constr. Corp., 867 Hempstead Turnpike, Franklin Square, N. Y., CA $344,200, electric (Brentwood, N. Y.).

▲ **Frank Briscoe Co., Inc.**, 287 S. 19 St., Newark, N. J. CA Est. $5,000,000, RESEARCH CENTER, 3 story laboratory, 1 story analytical laboratory and services bldg., FLORHAM PARK, N. J. Esso Research & Engineering Co., U. S. Hy. 1 and Park Ave. S., Linden, N. J. Bids Feb. 20. CD 2/11.

▲ **John T. Brady & Co., Inc.**, 606 W. 47 St., New York 19, N. Y., CA $2,437,000, general contract Contr. B-828VI, Nassau COUNTY OFFICE BLDG., Old County Rd. and County Seat Dr. West, Incorporated Village of Garden City, Town of Hempstead, MINEOLA, N. Y. Bd. Supervs. Nassau Co., County Old County Court House, Mineola, N. Y. Bids Jan. 28. CD 2/3, under LB.
Berwind & Co., Inc., 220 Nassau Blvd., Garden City South, N. Y., CA $901,970, Contr. B-828 V2, heating, ventilating and air conditioning office bldg. (Mineola, N. Y.).

▲ **Depot Constr. Corp.**, 42-15 Crescent St., Long Island City, N. Y., CA $2,515,000, Contr. No. 1055K1, general constr. County Welfare HOME, Jerusalem Ave., UNIONDALE, Town of Hempstead, N. Y. Nassau Co. Executive, Nassau Co., Old County Court House, Mineola, N. Y. Bids Feb. 25. Grand total $3,246,000. CD 2/27, under LB.
Mechanical Installations, Inc., 24-16 Bridge Plaza South, Long Island City, N. Y., CA $363,000, heating and ventilating (Uniondale, N. Y.);
ARC Electrical Constr. Co., Inc., 739 Second Ave., New York 16, N. Y., CA $368,000, electrical (Uniondale, N. Y.).

▲ **Jacob Lefferts**, 150 Iler Dr., Middletown, N. J., Owner Builds, $15,000,000, 600 HOUSES, Lyncroft Rd., MIDDLETOWN, N. J. Royal Barry Wills, 82 Charles St., Boston, Mass. Harson & Johns, Piedmont Rd. and Summit St., Tenafly, N. J., Clement Jablonsky, Willow Dr., Red Bank, N. J. and Wm. Chirgotis, 968 Stuyvesant Ave., Union, N. J., archts.

▲ **Arthur Venneri Co.**, 300 North Ave., Westfield, N. J., LB $10,136,000 or $10,297,000 est. $14,500,000 (3 bidders), general contract, seven 13 story, 1206 unit APARTMENTS, and 1 ADMINISTRATION BLDG. and Annex, NEWARK, N. J., Newark Housing Auth., 57 Sussex Ave., Newark, N. J., Bids Mar. 11. CD 2/5;
Fein-Schlossberg Inc., 1770 Second Ave., New York, N. Y., LB $1,287,000, plumbing, (Newark, N. J.);
John H. Cooney, Inc., 210 North 4 St., Harrison, N. J., LB $987,936, heating and vent. (Newark, N. J.);
Schoonover Co., Mountainside, N. J. and **N. Yeager**, 364 Mulberry St., Newark, N. J., LB $1,056,000, electric, (Newark, N. J.);
Seaberg Elevator Co., Inc., 243 44 St., Brooklyn, N. Y., LB $574,019, elevators, (Newark, N. J.).

▲ **Herbert Kendall**, State Hy. 27, Franklin Park, N. J. Own Forces $3,000,000, 300 HOMES, at Kendall Park, at Kendall Park off Rte. 27 between New Brunswick and Princeton at Franklin Park, SOUTH BRUNSWICK (P. O. FRANKLIN PARK) N. J. David Savage Drake, Corner Rd., Princeton, N. J., archt.

▲ **Navarro Corp.**, 6219 Broad St., Pittsburgh 6, Pa. CA $2,500,000 5 story, bsmnt., 576 x 200 steel, brick, block, BUS TERMINAL and GARAGE, PITTSBURGH, PA. Penna. Greyhound Lines, 2341 Carnegie Ave., Cleveland, O. CD 8/26.

▲ **Isner & Kecks**, 107 Wetzel Rd., Glenshaw, Pa. CA Est. $3,500,000, 2 story bsmnt. 50 x 60 ft. brick veneer, 19 APARTMENT BLDGS. PITTSBURGH, PA. Spring Hill Gardens, Inc., 107 Wetzel Rd., Glenshaw, Pa. Arthur E. Tennyson, 666 Washington Rd., Pittsburgh, Pa., archt.

▲ **S. H. Everet Co., Inc.**, Bloomsburg, Pa. LB $2,847,000 general contr. ENGINEERING BLDG. and PETROLEUM LABORATORY BLDG. for Pa. State University, UNIVERSITY PARK, PA. General State Auth. 18th and Herr Sts., Harrisburg, Pa. Bids Mar. 12. CD 2/6;

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† **Federal Government**
▲ **Project of $1,000,000 or over.**
ENR **Engineering News-Record**
CD **Construction Daily**

For additional reports see Construction Daily.

Riggs Distler & Co., Inc., 1518 Walnut St., Phila., Pa. LB $353,721 heating contract (University Park, Pa.);
Joseph L. Lecce, Inc., 612 W. Edwin, Williamsport, Pa. LB $469,664 electrical contract (University Park, Pa.).

▲ John Tester & Son, Inc., Box L-144, Clinton, Md., LB $2,095,135 (9 bidders) SCHOOL BLDGS., Military Rd., Oregon Ave. and 27th St. N. W., for St. John's College, WASH., D. C. St. John's College High School, 1225 Vermont Ave. N. W., Wash., D. C. Bids Mar. 13. CD 3/10.

▲ Northern Builders, Inc., 2501 Limestone Rd., Wilmington, Del., Separate Contracts, $2,500,000, RESIDENTIAL DEVELOPMENT, 200 houses, Holiday Hills, NEW CASTLE, DEL.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
April 11 Alabama

BUILDINGS—BA

▲† Va., Fort Belvoir—HOUSING—BA About 5/1—U. S. Eng., 1st and Douglas Sts. N.W., Wash., D. C., constr. 618 housing units (Capehart). Plans deposit $50. E. Tucker Carlton, 206 E. Cary St., Richmond, archt. CD 2/1/57.

▲ Kentucky and Indiana—BA 5/1—U. S. Eng., P. O. Box 59, Louisville, Ky., navigation lock, left bank Ohio River near existing Lock No. 41, CIVENG-15-029-58-50. Extended date. $10,000,000. CD 3/7.

HEAVY CONSTRUCTION—LB & CA

▲ GEORGIA—State Hy. Dpt., General Office No. 2, Capitol Sq., Atlanta, Bids opened 3/14,

Ga.—Georgia-Florida Paving Co., Inc., Box 85, Chiefland, Fla., LB $938,000, 14.76 mi. wid'n., reconstr., and resurf. Folkston-Kingsland Rd., State Rte. 40, beginning at State Route 25 in Kingsland and extend. west, Federal Aid Secondary Proj. S-0618 (7), Charlton and Camden Counties;

Ga.—J. D. Byrd, Box 182, Moultrie, Ga., LB $77,917, 4.217 mi. grading, paving, Ellenton-Omega Rd., FAS Route 547, beginning near Ty Ty Courthoust and extend. northwest to State Rte. 35 in Omege, Fed. Aid Sec. P. Proj. S 0547 (3), Colquitt and Tift Counties;

Ga.—Claussen Lawrence Constr. Co., Box 840, Augusta, Ga., LB $291,424, 6.508 mi. grading, paving and one bridge, Bellville-Statesboro Rd., FAS Rte. 1138, beginning at State Rte. 169 approx. 1 mi. south of intersection of State Rte. 169 and 129 and extend. northeast to State Rte. 73, approx. 6.5 mi. north of Claxton, Fed. Aid Sec. proj. S-1138 (2), Evans Co.;

Ga.—W. T. Anderson, Inc., Box 307, Thompson, Ga., LB $118,013, 4,828 mi. grading, paving Gibson-Thompson Rd., FAS Rte. 1454, begin. at State Rte. 16, approx. 1 mi. northwest of Jefferson Co. line and extend. west to Gibson-Harts Rd., Fed. Aid. Sec. Proj. S-1454 (1), Glascock Co.;

Ga.—Wilkes Constr. Co., Box 593, Washington, Ga., LB $135,470, 3.319 mi. grading, paving and one bridge Jefferson-Maysville Rd., FAS Rte. 887 beginning at end of present pavement approx. 1 mi. south of Oconee River and ending at State Rte. 98 in Maysville. Fed. Aid Sec. Proj. No. S-0887 (2), Jackson Co.;

Ga.—Shepherd Constr. Co., Box 8068 Station F, Atlanta, Ga., LB $867,990, 18,229 mi. wid'n., reconstr. and resurf. Millen-Augusta Rd., State Rte. 21, beginning near north city limit of Millen and ending in Waynesboro at point 90 feet north of the south city limit, Fed. Aid Proj. F-015-1 (17), Jenkins and Burke Counties;

Ga.—Sowega Farm Machinery Co., Edison, Ga., LB $250,340, 9.462 mi. grading, paving and one bridge FAS Rte. 648-State Rte. 27 Rd., FAS Rte. 1760, beginning at State Rte. 27 approx. 12 mi. east of Americus and extend. northwesterly to FAS Rte. 648 at point approx. 3 mi. northeast of Americus, FAP, S-1760 (1), Sumter Co.;

Ga.—Reeves Constr. Co., Box 473, Americus, Ga., LB $121,202, 7.14 mi. grading, paving, Oglethorpe-Talboton Rd., State Rtes. 90 and 127, beginning at end of existing paving in Mauk and northwest partly on relocation to State Rte. 96, near east city limit of Junction City, FAP. Secondary Proj. S-1156 (1) and S-1504 (1), Taylor and Talbot Counties.

Ga.—Holland Constr. Co., Box 215, Mt. Vernon, Ga., LB $422,386, 13.557 mi. grading, paving and two bridges, the Uvalda-Reidsville Rd., State Rte. 56, beginning State Rte. 4, approx. 12 mi. south of Lyons and extend. east to State Rte. 30, near Reidsville FA Secondary Proj. S-0599 (1), Toombs and Tatnall Counties;

Ga.—Hugh Steele, Inc., Box 398, Centre, Ala., LB $2,748,553, 8.854 mi. grading and 4 lane paving, one double stream bridge and 1 double and 3 single highway grade separation structures, Tifton-Cordele Rd. beginning at end of Proj. 1-401-1(11), approx. 7.8 mi. north of Tift Co. line and extend. north to Crisp Co. line, Fed. Aid Proj. 1-401-1(12), Turner Co.;

Ga.—Lothridge Bros., Inc., Box 81, Gainesville, Ga. LB $719,428, 7.305 mi. grading, paving and one bridge Blairsville-Young Harris Rd., State Rd. 2, beginning near east city limit of Blairsville and extending east to present curb and gutter section in Young Harris, F-058-1(7), Union and Towns Counties. CD 3/6.

▲ Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee, Wis. CA $4,983,654 design, mfg. and deliver com-

(Continued on page 74)

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SPECIAL PURPOSE
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JOINT FILLERS

Here are three widely used special purpose joint fillers—each with specific advantages and characteristics which permit it to provide optimum performance and utility. Complete data and specifications on each type are available upon request.

Sponge Rubber CEMENTONE®

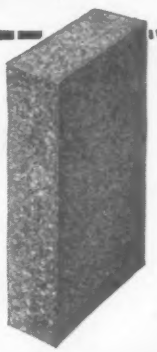
High quality blown sponge rubber, uniform in thickness and density. Neutral gray color blends well with concrete.

advantages

1. Blends with the color of concrete
2. Fully resilient
3. Non-extruding, with high recovery after compression.

recommended uses... For use in concrete structures where utmost resilience, non-extrusion and/or inconspicuous joints are desired. Ideal for use in tilt-up and bridge construction.

SELF-EXPANDING CORK



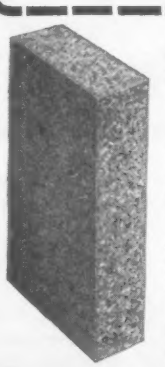
Similar in composition to Cork Joint, but is specially treated to enable it to expand as much as 50% beyond original thickness.

advantages

1. Fully compressible 2. Non-extruding
3. Will keep joint spaces filled under conditions which open joint to more than original size.

recommended uses...
For use in canal linings and structures, outlet works, spillways, stilling basins of dams, sewage disposal plants and water filtration plants.

CORK



Composed of granulated cork and synthetic resin binder molded under heat and pressure to form a flexible, waterproof filler.

advantages

1. Light in color 2. Compresses without extrusion
3. Recovers approximately 95% original thickness after compression.

recommended uses... Extensively used in flood walls, outlet works and spillways, sewage and water treatment plants, bridge construction.

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John J. Kane Hospital, Allegheny County, Pittsburgh, Pa. Auditorium is 109 feet in diameter, seats 682 people.

This auditorium dome for the John J. Kane Hospital went up in a hurry. Four workmen and one superintendent, using one crane with a 125-foot boom, erected the steel work in 9 days.

In preparation for the dome erection, a 20-inch pipe pole with a 48-inch diameter plate top was erected and plumbed. The spider or top section of the dome, which is about 11 feet in diameter, was then placed on top of the pole and bolted down.

The USS Structural Steel ribs were prefabricated on a 53'-7½" radius. They were made in two sections and were field-welded to form one rib almost 80 feet long, depending on the base elevation. The first rib was erected on the west side, followed by one on the east side. Erection then continued clockwise from both points.

The horizontal structural members were bolted in as erection progressed. Most of the bracing was omitted during erection and was filled in by the detail gang later on.

All sections were prefabricated in the plant of the Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.

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USS is a registered trademark

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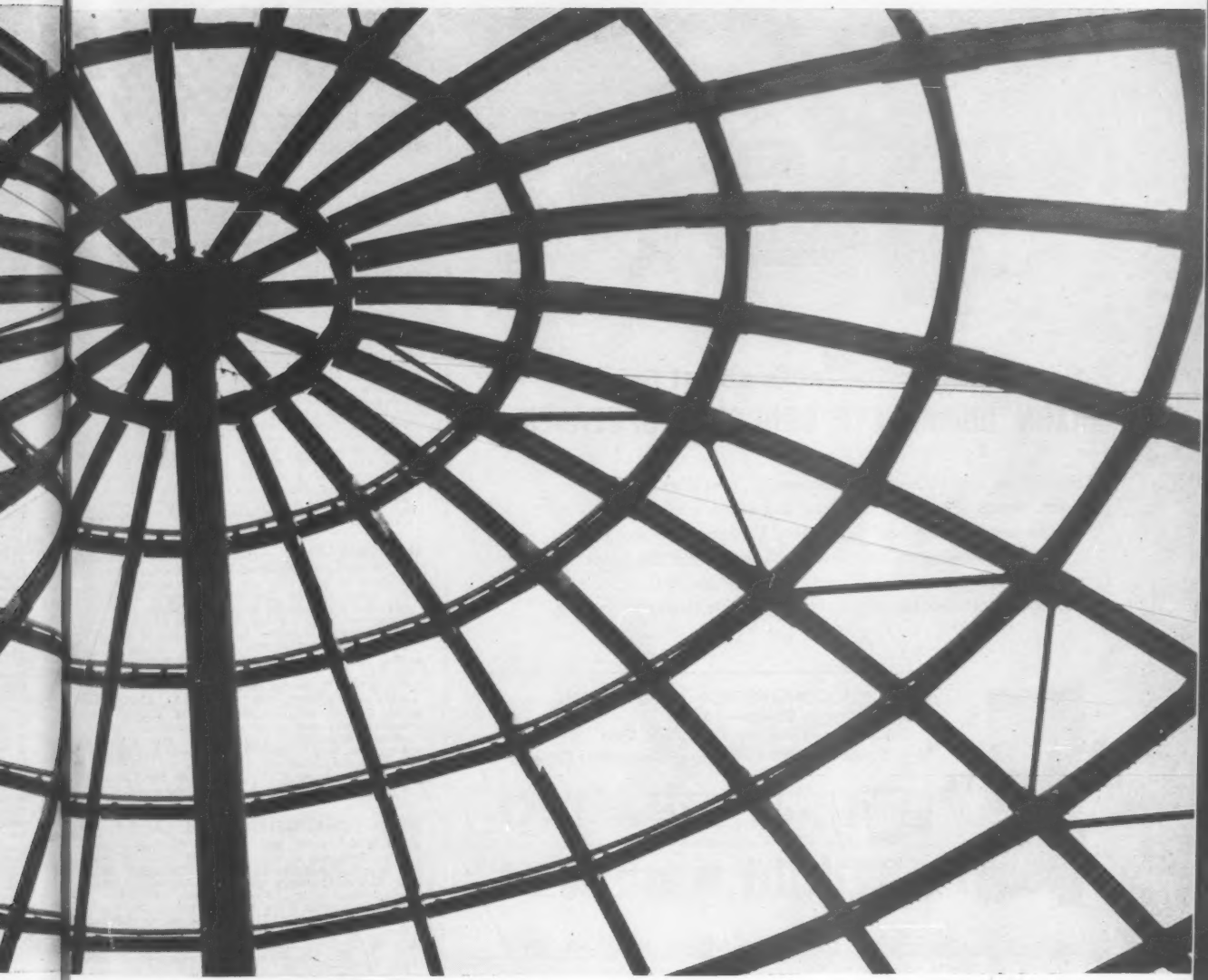

Auditorium dome fabricated from USS Structural Steel, erected by Adams Steel Erection, Kittanning, Pa. • Contractors: Sherry-Richards, Chicago, Ill. • Architects: Button and McLean—Mitchell and Richey, Pittsburgh, Pa. • Resident Engineer: Harry King, Allegheny County • Structural Engineers: L. W. Cook—R. A. Zorn, Pittsburgh, Pa.

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This Acid Tank at large mid-western forging plant, was poured with Sauereisen Pour-lay Concrete No. 54; 20' x 4' x 4', designed for 15% Sulfuric Acid at 150 to 175°F. In use for months with complete satisfaction.

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Ideal for lining existing tanks, saving time and replacement costs. 548

•Ask for catalog. **Sauereisen Cements Co., Pittsburgh 15, Pa.**

(Continued from page 71)

pressor drive sys. for 2nd increment of plenum evacuation sys., propulsion wind tunnel Arnold Engineering Development Center, RFP No. ENG-40-162 Neg. 58-5) No. DA-40-126 ENG 298 (Neg.) TULLAHOMA, TENN. U. S. Eng., Tullahoma, Tenn. CD 11/16/54.

BUILDINGS—LB & CA

▲ **F. N. Thompson Co.,** Pineville Rd., Charlotte, N. C., LB **$2,742,000,** 208,000 sq. ft., 380-bed MEMORIAL HOSPITAL, RALEIGH, N. C. Wake Co. Hospital Auth., Court House, Raleigh, N. C. J. N. Pease & Co., 119½ E. 5th St., Charlotte, N. C., engrs.-archts. Bids Mar. 14, CD 1/23.

▲ **Reynolds Metals Co.,** Reynolds Bldg., Richmond, Va., Owner Builds, **$3,000,000,** addns., expansion of present Foil PLANT, 3101 Hale St., LOUISVILLE, KY. CD 4/2/53.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 8 Wisconsin

STREETS AND ROADS

April 1, 15 Ohio April 2 Michigan. April 8 Wisconsin

▲ **Ill., Chicago**—BA 4/1—Cook Co., County Bldg., Chicago, b. conc. paving 0.84 mi. Central St. from Lincolnwood Dr. to Green Bay Rd., Sec. 118-0506, 1-MFT, in Evanston, $175,000, CD 3/6; b. conc. paving, concrete gutters 9.18 mi. Elgin Rd. from Willard to Devon Aves., Sec. 131-0111-MFT, in Elgin, $1,575,000, CD 1/2; b. conc. paving 1 mi. Dempster St. from McDaniel to Ridge Aves., Sec. 123-1011-MFT, in Evanston, $200,000, CD 3/6; b. conc. paving 1.61 mi. Devon Ave. from Rose Ave. to Canfield Rd., Sec. 135-1618-MFT, in Park Ridge, $350,000; b. conc. paving 1.45 mi. Devon Ave. from Rohling Rd. to Arlington Hts. Rd., Sec. 135-0708.1-MFT, in Cook Co., $280,000; b. conc. paving 1.26 mi. Elmhurst Rd. from Evanston-Elgin Rd. to N.W. Hy., Sec. 013-0405.2-MFT, in Mt. Prospect, $260,000, CD 3/6; b. conc. paving 0.5 mi. Glenview Rd. from Lincoln St. to Waukegan Rd., Sec. 116-0404.1-MFT, in Glenview, $110,000, CD 3/6; b. conc. paving 1.12 mi. Harrison St. from 19th to 1st Aves., Sec. 155-0405-MFT, in Maywood-Broadview, $235,000; b. conc. paving 0.53 mi. Lincoln Ave. from Niles Center Rd. to Howard Sts., Sec. 048-1111-MFT, in Skokie, $110,000.

BUILDINGS—BA

▲ **O., Sylvania**—RESIDENTIAL—BA 4/15—Trustees of Crestview of Ohio, Inc., c/o Flower Hospital, Cherry St., Toledo, 171-unit, 7 story bldg. lift-slab concrete apartment Community for Elderly, with lounge, library, dining room, chapel, audit., etc. Harroun Rd. $2,000,000. Sanborn, Stekettee & Assocs., Otis & Evans, 1214 Cherry, Toledo, archts. CD 6/25.

▲ **Wis., Racine**—SCHOOL—BA 4/25—Bd. Educ., 100,000 sq. ft. Jerstad-Agerholm Junior High School, $2,000,000, W. Holmes, 2200 Michigan Natl. Tower Bldg., Lansing, Mich., archt. CD 11/8.

▲ **Ill., East St. Louis**—HOUSING—BA 7/1—East St. Louis Housing Auth., Stephen M. Harris, exec. dir., Spivey Bldg., 500-unit public housing, three 8 story bldgs. and forty 2 story bldgs., in area bounded by Missouri Ave., 13th St., Broadway and 16th St. $7,890,750, Joseph D. Standish, Spivey Bldg., archt. Joseph Goldenberg, 624 A Missouri Ave., engr. CD 7/24/56.

HEAVY CONSTRUCTION—LB & CA

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Hys., Centennial Bldg., Springfield,

Ill.—**General Paving Co.,** 30 E. John, Champaign, Ill., CA **$2,066,143,** paving 4.96 mi. on FA1 Rte. 5, and interchange near St. Joseph, Champaign Co.;

Ill.—**E. T. Simonds & J. D. Barter Constr. Co.,** Carbondale, Ill., CA **$757,777,** paving 2.89 mi. FA 14 from Crainville Rd. to Ill. Rte. 48, Williamson Co.;

Ill.—**Triangle Constr. Co.,** 400 N. Evergreen, Kankakee, Ill., CA **$733,925,** wid'n. and new paving on US 45 bit. Carrier Mills and Stonefort, Saline and Williamson Counties;

Ill.—**Maclair Asphalt Co.,** 6000 Collinsville, East St. Louis, Ill., CA **$214,869,** concrete bit. resurf. on same project on US 45, Saline and Williamson Counties, Grand total $3,772,714. CD 3/12, Bids 2/25.

BUILDINGS—LB & CA

▲ **Eaton Holding Co.,** 806 Citizens Bldg., Cleveland 14, O., Own Forces, **$4,650,000,** 300 HOMES, Irma Dr. off S. Hampden Rd., CHARDON, O. Al Koplan, c/o owner, designer.

▲ **W. H. Davis & Son, Inc.,** 22 Winner Ave., Columbus, O., Owner Builds, **$20,000,000,** 1,000 HOME RESIDENTIAL SUBDIVISION, Hamilton Rd. and Livingston Ave., COLUMBUS, O.

▲ **Joseph M. Brickman Co.,** 7830 W. Lawson Noridge, Chicago, Ill., LB **$2,259,000,** general contract 314 low-rental HOUSING, PROJ. 5-6, DAYTON, O. Dayton Metropolitan Housing Auth., 1201 Brennan Dr., Dayton, O. Allied Architects, 1310 Rulman Bldg., Dayton, O., archts. Bids Mar. 11. CD 2/14;
Westerfield Plumb. Co., 2100 Hempsted, Dayton, O., LB **$318,800,** plumbing contract, Proj. 5-6, HOUSING, (Dayton, O.).

▲ **Louis J. Dankovich & William P. Gale,** 508 Wirt St., Youngstown, O., Owner Builds, **$2,000,000,** 160-

unit HOUSING DEVELOPMENT, McKelvey Heights area, east of Liberton Rd. and south of Mariner Ave., YOUNGSTOWN, O.

▲ **James McHugh Constr. Co.,** 6449 E. South Park, Chicago, Ill., LB **$4,294,260,** HOSPITAL addn., 1835 W. Harrison St., CHICAGO, ILL. Cook Co., Chicago, Ill. CD 3/7.

▲ **Loewy-Hydropress Div., Baldwin-Lima-Hamilton Co.,** 111 5 Ave., New York, N. Y., CA Est. **$12,000,000,** ROLLING MILL PLANT, MANITOWOC, WIS. Olin Mathieson Aluminum Co., 1512 Washington St., Manitowoc, Wis., CD 2/18, under CA.

▲ **Campbell Constr. Co.,** 9301 Michigan Ave., Detroit 10, Mich., CA Est. **$1,000,000,** RECREATION CENTER, incl. 42 bowling alleys, banquet and club facilities, service rooms, etc., Michigan and Gulley Rds., DEARBORN, MICH. Satellite Bowl Mel Groszko, 820 Drexel and Lloyd Lawson, 22411 Beech, both Dearborn, Mich. Campbell Engineering, Inc., 9301 Michigan Ave., Detroit, Mich., archt.

▲† **Knapp-Stiles Assocs.,** 1600 Linden St. S.E., Grand Rapids, Mich., CA **$5,224,000,** 340 unit HOUSING, K. I. Sayer Air Force Base, MARQUETTE, MICH. U. S. Eng., 1101 Washington Blvd., Detroit, Mich. Bids Feb. 13. CD 3/12, under LB.

▲ **A. J. Etikin Const. Co.,** 10111 Capital, Oak Park, Mich., CA Est. **$3,000,000,** SHOPPING CENTER, 15 Stores, 1-Mile and Grand River, REDFORD, MICH. Grand Shopping Triangle, Harold Sarko, Redford, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
April 1 Iowa

STREETS AND ROADS
April 1 Iowa **April 3 Kansas**

▲† **Texas—BA** About 4/30—U. S. Eng., 606 Santa Fe Bldg., Galveston, rectification and imprvs. to Brays Bayou, Almeda to Old Main and Chimney Rock Rd. to Richmond Rd., Houston, ENG-41-243-58-48. $2,500,000-$3,500,000.

BUILDINGS—BA

▲ **Neb., Omaha**—SCHOOL—BA 4/8—Bd. Educ., W. M. Huff, constr. supt., 39th and Davenport St., Horace Mann Junior High School, Florence Blvd. and Pratt St. $2,300,000. Plans deposit $100. Leo A. Daly Co., 633 Insurance Bldg. archt. CD 11/8.

▲† **N. M., Albuquerque**—HOUSING—BA 4/8—U. S. Eng., Box 1538, 213 units Capehart Housing at Sandia Base. Inv. No. ENG-29-005-58-8. $2,343,000. CD 3/11.

▲ **Mo., Columbia**—HOSPITAL—BA 4/15—At Daniel Boone Hotel, Columbia, 6 story, bsmnt., brick, steel, concrete, etc. hospital addn. for Boone Co. Hospital, Bd. Trustees, Charles H. Trimble, chn., Columbia, Mo. $3,000,000. O. W. Stigemeyer, 3 Sheraton Dr., St. Louis County 24, Mo. CD 10/7.

HEAVY CONSTRUCTION—LB & CA

▲† **List & Clark Constr. Co.,** 2 W. 40 St., Kansas City, Mo., CA **$5,828,752,** est. $5,915,860, completion of embankment at Tuttle Creek Dam and Reservoir, incl. constr. service bridge, near Manhattan, CIVENG-23-028-58-72, KANSAS. U. S. Eng., Federal Office Bldg., Kansas City 6, Mo. Bids Mar. 4. CD 3/7, under LB.

▲ **Farnsworth & Chambers, Inc.,** 3601 Brock, Houston, Tex. CA **$2,281,000.** hospital and clinic, Tinker Air Force Base, ENG-34-066-58-13, OKLAHOMA CITY, OKLA. U. S. Eng., Box 1, Tulsa, Zone 2, Okla. Bids Feb. 26. CD 3/4, under LB.

▲ **J. A. Jones Constr. Co.,** 209 W. 4th St., Charlotte 1, N. C., CA **$5,051,174** (Base Bid) outlet works and spillway and completion of embankment, Oologah Dam, Rogers Co., INV. NO. CIVENG-34-066-58-26, OKLAHOMA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Feb. 19, awarded Mar. 13. CD 3/4/58, under LB.

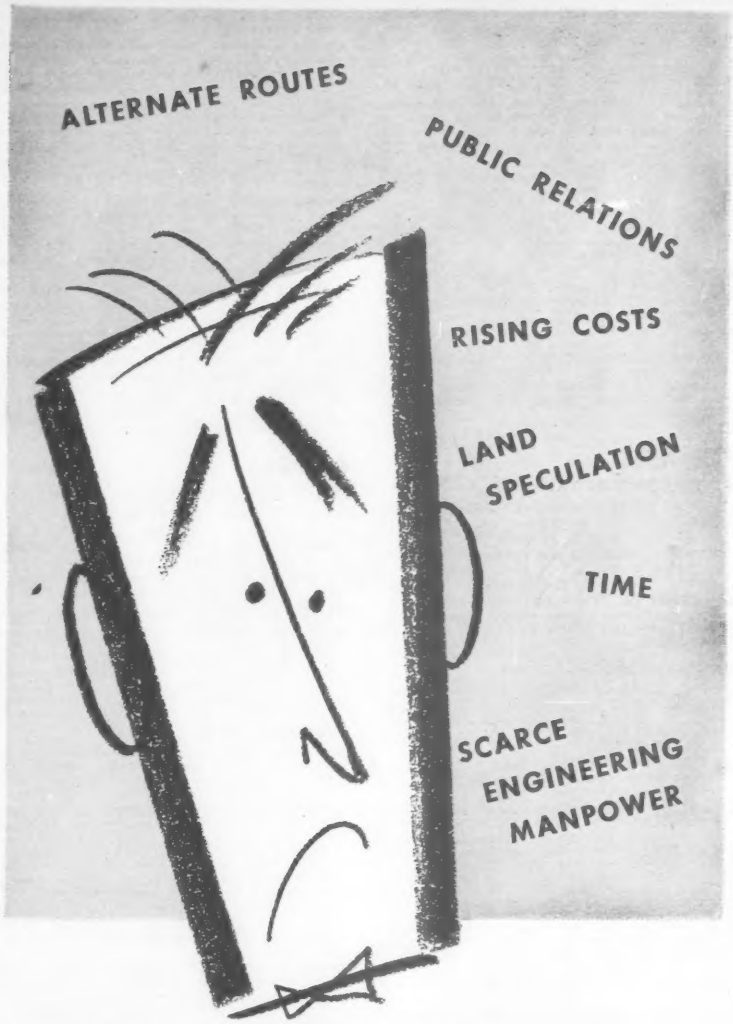
▲† **Massman Constr. Co.,** 3917 Broadway, Kansas City, Mo. and **John F. Beasley Constr. Co.,** Merchant Bank Bldg., Dallas, Tex., LB **$3,731,579,** steel, concrete bridge over Red River, ENG-34-066-58-40, OKLAHOMA. U. S. Eng., Box 61, Tulsa, Okla. Bids Mar. 12, CD 2/18.

BUILDINGS—LB & CA

▲† **Nuclear Products, Erco Div., ACF Industries, Inc.,** Riverdale, Md., CA 22,000 kw. boiling water NUCLEAR REACTOR and conventional fired superheater for Rural Co-operative Power Assn. Elk River, MINNESOTA. Atomic Energy Comn., 1901 Constitution Ave. N. W. Wash., D. C. Total est. **$9,000,000,** Sargent & Lundy, 140 S. Dearborn St., Chicago 3, Ill., engrs. Bids Jan. 13, CD 2/12, under LB; **Maxon Constr.,** 2600 Far Hills Rd., Dayton, O., CA, general constr. (Minnesota).

▲ **Fegles Constr. Co.,** Wesley Temple Bldg., Minneapolis, Minn., CA **$2,000,000,** PLANT exten. at Hoot Lake Station; addn. superstructure; furnishing Installing 53 500 kw elec. generator station burning lignite, FERGUS FALLS, MINN. Otter Tail Power Co., Fergus Falls, Minn. Bids Feb. 15. CD 1/30.

▲ **Power Service Corp.,** 711 Wesley Temple Bldg., Minneapolis, Minn., LB Over **$2,000,000,** constr. 53,000-kw electric GENERATOR addn. to power plant at Hoot Lake Station, FERGUS FALLS, MINN. Otter Tail Power Co., Fergus Falls, Minn. Bids Feb. 15. CD 1/30.



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▲ J. W. Bateson Co., Inc., 10130 Monroe Dr., Dallas, Tex. CA $6,829,575 Base Bid and Alternate, constr. POST OFFICE AND COURTHOUSE (lease-purchase proj.), OMAHA, NEB. General Services Admin., F St. between 18th and 19th Sts. N.W., Wash., D. C. Bids Mar. 11, awarded Mar. 18. CD 3/13 under LB.

▲ Combustion Engineering Co., Inc., 200 Madison Ave., New York, N. Y. CA $4,793,980 BOILER UNIT 4 at North Omaha Power plant OMAHA, NEB. Omaha Pub. Power Dist., 17th and Harney Sts., Omaha, Neb. CD 10/25.

▲ Carpenter Bros., 1335 Plowman, and J. W. Bateson Constr. Co., Inc., Box 13307, Walnut Hill Station, Dallas, Tex. CA Approx. $3,250,000, 12 story, 2 penthouses, bsmnt. OFFICE, DALLAS, TEX. Blue Cross & Blue Shield of Texas, 2208 Main St., Dallas, Tex. Leo L. Landauer & Assocs., Inc., 4801 Lemmon St., Dallas, Tex. engrs. CD 11/1.

▲ Brown & Root, Inc., Box 3, Houston, Tex. CA EST. $14,500,000 PLANT, HOUSTON, TEX. United States Gypsum Co., 3813 Buffalo Speedway, Houston, Tex. CD 8/23/55.

▲† Del E. Webb, S. 23rd Ave., and Rubenstein Constr. Co., 1012 N. 27th Ave., both Phoenix, Ariz., LB $15,849,000, SITE FACILITIES, Capehart Housing, Air Force Academy, (IFB) 05-613-58-30, COLORADO SPRINGS, COLO. Dpt. Air Force, Air Force Academy, Box 1670, Colorado Springs, Colo. Bids Mar. 18. CD 2/28.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 16 California

STREETS AND ROADS

April 4 Arizona April 8 Idaho
April 9, 16 California

▲† California—BA 5/20—U. S. Eng., 1209 8th St., Sacramento, dredging 7 mi. section Sacramento Deep Water channel and related levee work. $6,000,000. CD 9/10.

BUILDINGS—BA

▲ Calif., Sacramento—OFFICE—BA 4/8—Sacramento Municipal Utility Dist., 2101 K St., office bldg. on S. St. near 61st and parking facilities. $3,500,000. Dreyfuss & Blackford, 2127 Jay St., Sacramento, archts. CD 3/7/57.

▲† Calif., Lompoc—HOUSING—BA 4/15—Housing Contract Officer, Cooke Air Force Base, Lompoc, 525 family housing. $8,662,500.

▲ Calif., Los Angeles—STEAM PLANT IMPRVS.—BA 4/21—Los Angeles Dpt. Water & Power, 311 S. Spring St., furnishing, erecting on existing foundation at Haynes Steam Plant in Seal Beach, two 200,000 kw. steam turbine generating units. $15,000,000. CD 11/20/56.

HEAVY CONSTRUCTION—LB & CA

▲ N. Fiorito Co., Inc., 844 W. 48 St., Seattle, Wash., CA $2,336,752, runway extension and allied facilities at Larson Air Force Base, IFB ENG-45-164-58-20, MOSES LAKE, WASH. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Feb. 27. CD 3/5, under LB.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 3/13

J. A. Thompson & Son, Box 518, Inglewood, Calif. LB $3,135,130, est. $4,833,597 (7 bidders) hy. imprvs. in city of San Bernardino between 0.2 mi. south of Rte. 9 and 0.4 mi. north of 27th St. 6 lane freeway VIII-SBD-43, 31-SBD, San Bernardino Co. CD 2/13.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

Vinnell Co., Inc. & Vinnell Constructors, 1145 Westminster Ave., Alhambra, Calif. CA $7,157,916 3.1 mi. freeway and 17 structures on Golden State and San Bernardino Freeways between 6th and North of Mission Rd. on Golden State and between Macy and Fickett Sts. on San Bernardina Freeway incl. extensive traffic separation and interchange facilities at jct of 2 freeway Rtes. east of Los Angeles Civic Center. VII-4, 26 LA, Los Angeles Co. Bids Feb. 27, CD 3/3, under LB.

▲† McDonald & Kruse, 7540 Wheatland Ave., Sun Valley, Calif. LB $1,971,499 est. $2,500,000 (9 bidders) imprv. Big Dalton Wash Channel Los Angeles St. to Walnut Creek inlet channel, ENG-04-353-58-12, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 13. CD 2/19.

▲ Vido Artukovich, 11155 Rush St., El Monte, Calif. CA $3,142,505, est. $1,750,000, pipe line for second San Diego Aqueduct, 5.97 mi. near Temecula in Riverside and San Diego Counties, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 306 W. 3 St. Los Angeles, Calif. Bids Mar. 6, awarded Mar. 12. CD 3/10, under LB.

BUILDINGS—LB & CA

▲ Olson Constr. 1549 S. 2nd W., Salt Lake City Utah. LB $2,753,000, est. $2,000,000 HOSPITAL WING SALT LAKE CITY, UTAH. Holy Cross Order of Catholic Sisterhood, Sister Olivia Marie, Admin. 1045 E. 1st S., Salt Lake City, Utah. Bids Mar. 11. CD 2/18.

▲ Fisher Contg. Co., Box 6306, Phoenix, Ariz. CA $10,000,000 1½ mi. bbl. annual capacity cement PLANT, near CLARKDALE, ARIZ. Riverside Arizona-Cement Co., 621 S. Hope St., Los Angeles 17, Calif. Awarded Mar. 13.

▲† Hebb & Narodick, 232 4 Ave. N., Seattle, Wash., CA $6,074,424, 375 unit Capehart family HOUSING near American Lake, Inv. 58-48, FORT LEWIS, WASH., U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Feb. 26, CD 3/3 under LB.

▲ Cawdrey & Vemo, 3601 Fremont Ave., Seattle 3, Wash., LB $2,042,598, 5 story, 80,000 sq. ft. steel frame, rein.-con. bank bldg. addn., SEATTLE, WASH., National Bank of Commerce, 2 Ave. and Marion St., Seattle 4, Wash. Bids Mar. 11. CD 2/28.

▲† Frederickson & Kassler & Stolte, Inc., 212 13th St., Sacramento, Calif., CA $3,812,670, rehabilitation of bldgs. at Cooke Air Force Base, Item 2-0 added in ENG-04-353-58-40, LOMPOC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 12, awarded Mar. 14. CD 3/14, under LB.

▲ Millie & Severson and C. L. Peck, 1485 Canal Ave., Long Beach, Calif. CA $2,682,000, constr. Harbor Dpt. ADMINISTRATION BLDG., LONG BEACH, CALIF. Long Beach Harbor Dpt., 1333 El Embarcadero, Long Beach, Calif. Bids Mar. 6, CD 3/10, under LB.

▲ M. J. Brock & Sons, Inc., and R. J. Daum Constr. Co., 2894 Rowena Ave., Los Angeles, Calif. LB $2,359,000, est. $2,165,000 (10 bidders) 4 story rein.-con. HOSPITAL, REDONDO BEACH, CALIF. South Bay Hospital Dist., 1400 Highland Ave., Manhattan Beach, Calif. Bids Mar. 12, CD 2/24.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 1 British Columbia April 16 Ontario

STREETS AND ROADS

April 10 Northwest Territories, Nova Scotia
April 16 Ontario

HEAVY CONSTRUCTION—LB & CA

▲ BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

Peter Kiewit Sons Co. of Canada Ltd., 2182 W. 12th Ave., Vancouver, B. C., CA $2,157,282, reconstr. section of Trans-Canada Highway between Boothroyd and Jackass Mountain, Proj. No. 906, Boothroyd and Jackass Mountain. Bids Feb. 27. CD 2/20, under LB.

BUILDINGS—LB & CA

▲ Bennett & White Constr. Co. Ltd., 600 Howe St., Vancouver, B. C., CA $2,430,400, rein.-con. HOSPITAL, KITIMAT, B. C. Kitimat General Hospital, Society, Kitimat, B. C. Bids Feb. 27. CD 1/29.

▲ Newfoundland Engineering & Constr. Co. Ltd., Water St., St. John's, Newfoundland, CA Approx. $3,000,000 (3 bidders) Steam-operated ELECTRIC POWER PLANT addns., ST. JOHN'S, NEWFOUNDLAND. Newfoundland Light & Power Co. Ltd., Water St., St. John's, Newfoundland. Montreal Eng. Co. Ltd., 244 St. James St. W., Montreal, Que., engrs. Awarded Mar. 11.

▲ Carl E. Miller Constr. Ltd., 779 Little Simcoe St., London, Ont. Owner Biulds. $3,000,000, APARTMENT PROJECT, south of Carfrae St., LONDON, ONT. CD 3/18/54.

Duquette & Blumenthal, 2700 de Salaberry St., Montreal, Que., Owner Builds $2,160,000, 2 story, bsmnt., brick walls, 108-triplexes HOUSING PROGRAM, concrete fdn., du Toutraincourt St., MONTREAL, QUE.

▲ Lummus Co. Canada Ltd., 455 Craig St., W., Montreal, Que., CA Est. $30,000,000, OIL REFINERY PROJECT, incl. distillation unit, catalytic reformer, catalytic cracker with associated polymerization unit and hydro desulphizer and dock, on 600 acre site, MONTREAL, QUE. B. P. (Canada) Ltd., 550 Sherbrooke St., W., Montreal, Que. Awarded Mar. 11.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ SADE—Sociedad Argentine de Electrification S. A. (Gis. Gruppe Industria Elettro Merchaniche per Impianti all'Estoro of Italy), CA Est. $6,200,000. dam and power plant at Florentino Areghino, on Chubut and Chico Rivers, ARGENTINA. Water & Power Bd., Govt. of Argentina, Buenos Aires, Argentina.

PROPOSED PROJECTS

WATER SUPPLY

▲ Md., Baltimore—City, Bureau Water Supply, 505 Municipal Bldg., Zone 2, 38 mi. 9 ft. pipe lines, tunnels, pumping stations and reservoir to bring water from Conowingo dam-Susquehanna River to Baltimore. $35,000,000. Whitman Requardt & Assocs., 1304 St. Paul St., Zone 2. Design engrs. Bernard L. Werner, c/o owner. First stage to be advertised for bids this month. CD 11/9/56.

▲ Que., Montreal—City, City Hall, addni. filter gallery at City Waterworks, 3161 Joseph St. $2,500,000. CD 9/13/44.

SEWERS, WASTE DISPOSAL

▲ Mo., St. Joseph—Bd. P. Wks., City Hall, defeated bonds Mar. 4, sewerage sys. and sewerage treatment plant. $9,150,000. Black & Veatch, 1500 Meadow Lake Parkway, Kansas City 14, Mo., engrs. CD 2/10.

▲ N. J., Rahway-Woodbridge-Carteret—Rahway Valley Sewerage Auth., E. Hazelwood Ave., Rahway, exten. outfall sewer mains from Rahway-Woodbridge to Arthur Kill in Carteret. $2,000,000. Elson T. Killam, 529 Millburn Ave., Millburn, consult. engr.

▲ Wash., Tacoma—City, City Hall, voted $2,775,000 bonds Mar. 11, improve, extend storm drainage sys. in West End and elsewhere. CD 1/20.

BRIDGES

▲ CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford,

New Haven Co.—bridge over Naugatuck River and approaches, East Derby, $1,200,000.

Proj. 92-93, Fed. Proj. UG-043 (3) bridge over New Haven R. R., Route 34, $4,700,000, Bids before June, 1958, D. B. Steinman, 117 Liberty St., New York, N. Y., consult. engr. CD 3/25/57.

STREETS AND ROADS

▲ CONNECTICUT—State Hy. Dpt., 165 Capital Ave., Hartford,

New Haven Co.—relocation Route 8, Naugatuck, Proj. 87-67, Fed. Proj. U-47(7), $5,500,000, Bids before June, 1958. Edwards, Kelsey & Beck, 250 Park Ave., New York, N. Y., consult. engrs. CD 9/15/55.

▲ IDAHO—State Hy. Dpt., Boise,

Bannock Co.—grading, structures, railroad separator 1 mi. U. S. 30 N, $739,000.

grade, structures, 4-lane, 4.5 mi. U. S. 91-191, $1,800,000.

grade, structures, 4-lane 4.1 mi. U. S. 91-191, $1,600,000.

plantmix 10 mi. U. S. 91-191, $820,000.

grade, plantmix, curb and gutters 2.3 mi. U. S. 30 N, Pocatello streets, $500,000.

Bear Lake Co.—surf., bit. surf. treatment 8.2 mi. U. S. 89, $900,000.

grade, surf., bit. surf. treatment 5.9 mi. U. S. 30 N, $600,000.

grade, surf., bit. surf. treatment 7 mi. U. S. 30 N., $700,000.

surf., bit. surf. treatment 7 mi. U. S. 30 N., $700,000.

Bingham Co.—surf., plantmix 1.5 mi. U. S. 26, $500,000.

surf., plantmix 23 mi. U. S. 91-191, $3,000,000.

grade, base, major structures 7 mi. U. S. 91-191, $2,500,000.

grade, 2 interconnections, base 8 mi. U. S. 9-191, $2,200,000.

grade, base, minor structures 8 mi. U. S. 91-191, $2,160,000.

Oneida Co.—grade, major structures, plantmix, 5.5 mi. U. S. 191, $2,723,000.

grade, major structure, plantmix 5.2 mi. U. S. 191, $2,274,000. C. E. Aldrich, Pocatello, staff engr.

▲ PENNSYLVANIA—Pa. Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,

Erie Co.—5.39 mi. 4 lane divided hy. and 5 grade separations from 1 mi. west of L. R. 25018 to ½ mi. east of L. R. 351 a section of Erie Thruway (Proj. 803-1) FAI, $4,645,280.

5.1 mi. 4 lane divided hy. with 7 grade separations from ½ mi. east of L. R. 351 to ¾ mi. east of L. R. 88, Section Erie Thruway (Proj. 804-1) FAI $6,261,430.

2.92 mi. 4 lane divided hy. with bridge over 4 mi. creek and 3 grade separations from ¾ mi. east of L. R. 88 to ¾ mi. NE of LR 25067 Section Erie Thruway (Proj. 805-1) FAI, $3,938,670.

4.83 mi. 4 lane divided hy. with 4 grade separations from ¼ mi. NE of L. R. 25057 to ¼ mi. SW of L. R. 25071 Sec. Erie Thruway (Proj. 807-1) FAI $5,153,180.

4.11 mi. 4 lane divided hy. with 2 bridges and 3 grade separations from ¾ mi. SW of L. R. 25071 to ¼ mi. SW of LR 304 Spur. section of Erie Thruway, (Proj. 808-1) FAI, $5,618,850.

4.28 mi. 4 lane divided hy. with 2 parallel bridges and 7 grade separations from ¾ mi. SW LR 304 spur to New York State line, Section Erie Thruway (Proj. 809-1) FAI, $7,357,120. S. P. Longstreet, ch. engr.

AIRPORTS

▲† Ariz., Phoenix—OPERATIONAL AND TRAINING FACILITIES—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. operational and training facilities and utilities at Luke Air Force Base, SAGE. $11,582,000. CD 9/20.

▲† Idaho, Mountain Home—AIR BASE IMPRVS.—U. S. Eng., City-County Airport, Walla Walla, Wash., operational and training facilities, and utilities, Mountain Home Air Force Base. $4,380,000. CD 9/17.

▲† Mass., Chicopee Falls—OPERATIONAL FACILITIES, etc.—U. S. Eng., 150 Causeway St., Boston, operational and training facilities and utilities, Westover Air Force Base, SAC. $2,368,000.

▲† Mass., Falmouth—OPERATIONAL FACILITIES, etc.—U. S. Eng., 150 Causeway St., Boston, operational and training facilities, maintenance and production facilities and utilities, Otis Air Force Base, SAC. $7,079,000. CD 8/21/56.

▲† Mich., Kinross—OPERATIONAL FACILITIES, etc.—U. S. Eng., 1101 Washington Blvd., Detroit, operational and training facilities, supply facilities, housing and community facilities, utilities, Klnross Air Force Base, SAC. $23,762,000. CD 8/21/56.

▲† Mich., Oscoda—OPERATIONAL FACILITIES, etc.—U. S. Eng., 600 E. Jefferson St., Detroit, opera-

tional and training facilities, maintenance and production facilities, supply facilities, housing and community facilities, and utilities, Wurtsmith Air Force Base, SAC. $22,349,000. CD 9/17.

▲† Mich., Selfridge Air Force Base—OPERATIONAL FACILITIES, etc.—U. S. Eng., 600 E. Jefferson Ave., Detroit, operational and training facilities, maintenance and production facilities, supply facilities, and utilities, Selfridge Air Force Base. $17,487,000.

▲† Mont., Glasgow — OPERATIONAL and TRAINING FACILITIES, etc.—U. S. Eng., City-County Airport, Walla Walla, Wash., operational and training facilities, maintenance and production facilities supply facilities, housing and community facilities and utilities, Glasgow Air Force Base, SAC. $29,644,000. CD 9/19.

▲† Mont., Great Falls—OPERATIONAL and TRAINING FACILITIES, etc.—U. S. Eng., City-County Airport, Walla Walla, Wash., opeartional and training facilities and utilities, Malmstrom Air Force Base, SAGE $6,901,000, operational and training facilities Malmstrom Air Force Base, SAC, $872,000. CD 9/18.

▲† N. J., Wrightstown—OPERATIONAL and TRAINING FACILITIES—U. S. Eng., 2655 Abbottsford Rd., Phila., Pa., operational and training facilities, maintenance and production facilities, supply facilities, housing and community facilities and utilities, McGuire Air Force Base, SAC $6,979,000. CD 9/7/55.

▲† N. D., Minot—AIR BASE IMPRVS.—U. S. Eng., 1709 Jackson St., Omaha, Neb., operational and training facilities and utilities, Minot Air Force Base, SAGE. $10,338,000. CD 9/17/56.

▲† O., Dayton—AIR BASE IMPRVS.—U. S. Eng., 830 W. Broadway, Louisville, Ky., operational and training facilities, maintenance and production facilities, supply facilities, utilities and ground mprvs., Wright-Patterson Air Force Base. $22,632,000. CD 9/17.

▲† O., Wilmington—AIRPORT IMPRVS.—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., operational and training facilities, maintenance and production facilities, supply facilities housing and community facilities, and utilities, Clinton County Air Force Base, SAC $8,776,000.

▲† S. D., Rapid City—OPERATIONAL and TRAINING FACILITIES—U. S. Eng., 1709 Jackson St., Omaha, Neb., operational and training facilities Ellsworth Air Force Base. $3,194,000.

▲† Wash., Tacoma — OPERATIONAL and TRAINING FACILITIES—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, operational and training facilities, McChord Air Force Base, SAC, $4,995,000. CD 9/16.

▲† Newfoundland—Stephenville—AIR BASE IMPRVS.—U. S. Eng., Eastern Ocean Dist., Office Ottawa Defence Constr., 56 Lyon St., Ottawa, Ont., operational and training facilities and maintenance and production facilities, Ernest Harmon Air Force Base, $2,217,000.

PUBLIC BUILDINGS

▲ Calif., Vallejo—SCHOOLS—Vallejo City Unif. School Dist., c/o Supt., 111 Idaho St. $4,333,000 bond election June 3, elementary school and Junior High School and existing schools addns. CD 9/20.

▲ Colo., Denver—MEDICAL CENTER—University of Colorado, Dpt. Medicine, 4200 E. 9th Ave., preliminary plans by Schmidt, Garden & Erikson, archts.-engrs., 104 S. Michigan Ave., Chicago 3, Ill., hospital clinical research bldg., out-patient facilities, medical school. $17,250,000. CD 1/9/57.

▲ Colo., Lakewood—SCHOOLS—Jefferson Co. School Dist., No. R-1, 1580 Yarrow, Lakewood, $9,940,000 bond election, May 27, Senior High School; two Junior High Schools; nine elementary schools, and addns. to 2 high schools and 5 grade schools, in Arvada, Wheatridge, Golden, Lakewood. CD 10/23.

▲ Colo., Pueblo—SCHOOLS—School Dist. No. 60, 102 West Orman Ave. $7,750,000 bond election May 5, Elementary School addns. and 2 Junior High Schools. CD 1/13.

▲ Conn., Groton — HOUSING — Groton Housing Auth., Central Ave., Poquonnock Bridge, Conn., 500 unit, low income housing. $6,500,000.

▲ Del., Wilmington—SCHOOL—Wilmington Bd. P. Educ. 511 W. 8th St., plans by Whiteside, Moeckel & Carbonell, 909 Tatnall St., high school, $3,500,000. Louis H. Doane, Penn RR Bldg., consult. engr. CD 3/30/56.

▲ Md., Baltimore—MUSIC and ARTS—State Dpt. P. Imprvts., 506 Park Ave., Zone 1, plans by Gaudreau & Gaudreau, 330 N. Charles St., Zone 1, masonry, concrete steel music and arts bldg. for Morgan College (colored). $2,000,000. CD 11/15/50.

▲† Md., Fort George G. Meade—SERVICE CLUB, etc.—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, plans by John Carroll Dunn, 717 Washington Pl., Baltimore, 1 story, 23,000 sq. ft. combination service club and library, $100,000-$500,000; Bids in April; plans by Geo. W. Ewing Co., archt.-consult. engr., Western Saving Fund Bldg., Phila., Pa. 3 story, brick completely air-conditioned, 150-bed hospital, central heating plant, parking area, basic utilities to enable expansion to 300 beds. $3,000,000-$5,000,000; Bids in May; permanent airfield facilities involving 3,000 ft. runway for wing aircraft, connecting taxiway parking apron, airfield lighting also provisions for heliport, $500,000-$1,000,000; Bids in May. Benjamin E. Beavin Co., 104 E. 25 St., Baltimore, Md., consult. engr. CD 8/30/56.

▲ Md., Jessup—DIAGNOSTIC CENTER—State of Maryland, Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md., plans by Lucius R. White, Jr., 1009 N. Calvert St., Baltimore, Zone 2, masonry, steel, concrete diagnostic center, Patuxent Institute. $2,000,000.

▲ Mich., Dearborn—CIVIC AUDITORIUM—City, Mayor Orville L. Hubbard, $3,500,000 bond election Apr. 22, civic auditorium with 6,500 seat capacity, at Michigan and Greenfield. Election date changed. CD 1/10.

▲† Mich., Marquette—ADMINISTRATIVE FACILITIES, etc.—U. S. Eng., 1101 Washington Blvd., Detroit, administrative facilities, SAGE $277,000; operational and training facilities, supply facilities, housing and community facilities and utilities, both at K. I. Sawyer Airport, SAC. $27,233,000.

▲ Minn., Mankato—SCHOOLS—Bd. Educ., Consolidated School Dist. No. 71, c/o D. E. Swenson, pres., voted $3,600,000 bonds Mar. 4, high school addn., two grade schools, etc. CD 1/23.

▲ N. J., Englewood—SCHOOL—City, City Hall, plans by Lawrence Licht & Frank Johnson, 19 Knickerbocker Rd., Junior High School and auditorium to Dwight Morrow to be connected by passageway, Tyron Ave. and Liberty Rd. $4,900,000. CD 7/18/56.

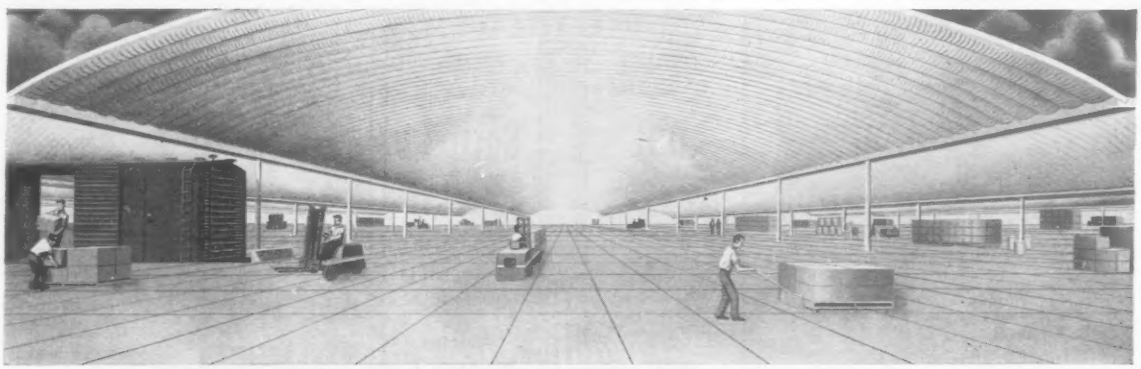
▲ N. Y., New York—HOUSES—New York City Housing Auth., 299 Broadway, Zone 17, plans by Hart, Jerman & Assoc., 250 E. 43 St., Zone 17, N. Y., Proj. NYS-80-Rutgers Houses (formerly called Cathay Houses) Cherry, Pike, Madison and Rutgers Sts. $12,000,000. CD 3/1.

▲ N. Y., New York—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by Silverman & Cika Associates, 40 E. 68 St., Zone 21, and Horace Ginsbern & Assocs., 205 E. 42 St., Zone 17. Proj. NYS 44, Mott Haven Houses, E. 140 St., Alexander Ave., 3 Ave. and E. 144 St. $12,000,000.

▲ Ore., Salem—LABOR AND INDUSTRIES—State Bd. Control, Capitol, Salem, plans by Skidmore, Owings & Merrill, 2040 Jefferson St., Portland, Labor and Industries Bldg., Capitol Mall. $3,000,000. Bids in March 1959. CD 8/29.

▲ Pa., Cornwells Heights—SCHOOL—Bensalem Twp. School Auth., plans by H. F. Everett & Assoc., 512 Hamilton St., Allentown, Cecilia Snyder Junior High School. $2,300,000. S. W. Herring, 512 Hamilton St., Allentown, consult. engr. Bids in June. CD 4/6.

▲ Pa., Phila.—CITY HALL—Dpt. Procurement, City Hall Annex, plans by Vincent G. Kling, 917 Corinthian Ave., city hall annex. Reyburn Plaza. $16,100,000. CD 10/29/53.



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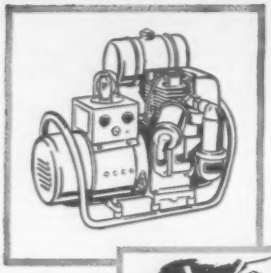

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▲ **Pa., Phila.**—POLICE ADMIN.—Dpt. Procurement, City Hall Annex, plans by Geddes, Brocher & Quails, 2047 Locust St., police admin. bldg., 7th and Vine Sts. $3,280,000. CD 4/15/46.

COMMERCIAL BUILDINGS

▲ **Calif., San Francisco**—HOTEL—Hilton Hotels 350 Sansome St., plans by Wm. B. Tabler, 401-7th Ave., New York, N. Y., hotel O'Farrell, Mason, Ellis and Taylor St. $20,000,000. CD 9/10.

▲ **Conn., Hartford**—HOSPITAL—St. Francis Hospital, 114 Woodland St., plans by York & Sawyer, 101 Park Ave., New York, N. Y. and Kiff, Colean, Voss & Souder, assoc. archts., 101 Park Ave., New York, N. Y., 4 story buff limestone Medical Library, Hospital Wing, Woodland St. $3,000,000. Jansen & Rogan, 500 Fifth Ave., New York, N. Y., consult engrs. CD 1/2/57.

▲ **Ill., Chicago**—OFFICE—American Medical Assn., Grand and Dearborn Sts., plans by Harper Richards, 1350 N. Dearborn St., office addn. $2,000,000.

▲ **La., New Orleans**—DORMITORY—Tulane University, 6824 St. Charles Ave., 4 story wing and 7 story wing men students dormitory. $2,100,000.

▲ **Mass., Boston**—POST OFFICE—General Service Admin. P. Bldg. Service, F between 18 and 19 N.W., Wash., D. C., post office (lease-purchase project) $27,000,000. CD 2/15/49.

▲ **N. J., Camden**—HOSPITAL—Cooper Hospital, Sixth and Stevens Ave., plans by George Von Uffel, 30 Warwick Rd., Haddonfield, 2 wings to existing hospital, $2,000,000. Horace B. Nicholson, 215 S. Broad St., Phila., Pa., consult. engr. CD 3/14/57.

▲ **Okla., Tulsa**—APARTMENT—Raymond D. Nasher Park Apartments, National Bank Bldg., Dallas, Tex., 16 story apartment, Riverside Dr. and Woodward Blvd. $4,000,000.

▲ **Tex., El Paso**—POSTOFFICE—General Services Admin., F St. between 18 and 19 Sts. N. W., Wash., D. C., 85,000 sq. ft. masonry postoffice (lease-purchase project). $2,000,000.

▲ **Wash., Renton**—SHOPPING CENTER—Edwards, Inc., Renton, plans by Young, Richardson & Carleton, Central Bldg., Seattle, Zone 4, shopping center, $8,000,000, Work to start in June.

▲ **Ont., Ottawa**—BANK, etc.—The Royal Bank of Canada, 360 St. James St. W., Montreal, Que., plans by E. T. Warren, c/o owner, 8 story bank bldg., 2 bsmnt. floors to provide parking, structural steel frame, masonry and granite constr., escalators, Sparks and Metcalfe Sts., $5,000,000. Work to begin May 1959. CD 1/7.

INDUSTRIAL BUILDINGS

▲ **Calif., Fairfield**—PLANT—Shasta Pulp & Paper Co., (subsidiary Champion Paper & Fibre Co., 601 N. B St., Hamilton, O.) 235 Montgomery St., San Francisco, pulp and paper plant near here $30,000,000.

▲ **Md., Benedict**—POWER PLANT—Potomac Electric Power Co., 10 and E. Sts. N. W., Wash., D. C., power plant on Patuxent River between Chalk Point and Eagle Harbor, near here. $35,000,000.

▲ **N. J., Paulsboro**—PLANT—Dixon Chemical Industries, Inc., 1051 Bloomfield Ave., Clifton, expansion of plant, Thomas Lane Paulsboro, $7,000,000, Singmaster & Breyer, 420 Lexington Ave., New York, N. Y., consult. engrs.

▲ **N. Y., New York**—WAREHOUSE, etc.—Syndicate, c/o David & Earl Levy, archts., 70 E. 45 St., Zone 17, 9 story warehouse and distribution center at west side of Ninth Ave. between 34 and 35 Sts. at 433-447 Ninth Ave. $5,000,000.

▲ **O., Cincinnati**—PLANT—Ralston Purina Co., 835 S. 8th St., St. Louis, Mo., cereal mfg. plant, Mosteller Rd. $15,000,000. CD 2/14.

▲ **Tex., Coppell**—PLANT—Dallas Power & Light Co., Dallas Power & Light Bldg., Dallas, steam electric generating plant at North Lake. $17,945,000.

UNCLASSIFIED

▲ **Ill., Chicago**—LICENSE TESTING STATIONS—Dpt. Pub. Wks., Springfield, plans by DeLeuw Cather & Co., 150 N. Wacker Dr., 3 drivers license testing stations; paving Congress Expressway and Central Ave.; Elston & Latrobe Ave. and 99th St. and South Park Ave. $3,500,000.

▲ **N. Y., Medford Station**—AMUSEMENT PARK—Space-O-Rama Park, c/o Vincent J. Passalaqua, 194 East Main St., Babylon, "Space-O-Rama" park, incl. small planetariam, amphitheater and concert hall with seating capacity 700-800, rocket operating 2,000 ft. monorail, satellite-shaped restaurant with combination roller and ice skating rink, also to include parking facilities for about 5,000 cars,. miniature golf course, concrete moon and six planets, 24-alley bowling center and dozen or more rides for adults as well as children on 49 acre site 1 mi. southeast Jericho Turnpike and Rte. 112, about 6 mi. north Patchogue. $6,000,000.

▲ **Texas**—GAS LINES—Humble Oil & Refining Co., 1216 Main St., Houston, 250-mi. 26 or 30 in. gas line from area McAllen to Houston. $10,500,000; 200 mi. various sized gas pipe gathering lines between McAllen and Houston, $3,750,000.

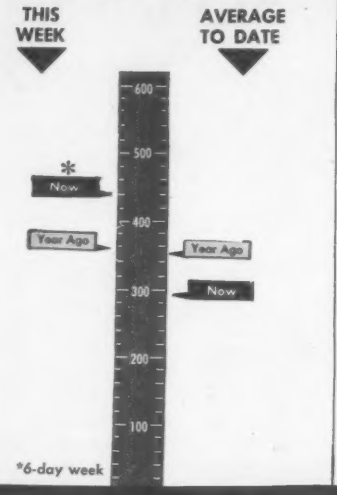
▲ **Ontario**—GAS PIPELINE—Union Gas Co. of Canada Ltd., 48 Fifth St., Chatham, gas pipe line extend along Hy. No. 18 from Ojibway to Amherstburg, to service LaSalle, Amherstburg, Ojibway, Anderdon Twp., Malden Twp., Sandwich West Twp., $2,000,000.

(Proposal Advertisement see pp. 85 to 89)

Construction Scoreboard

ACTIVITY THIS WEEK

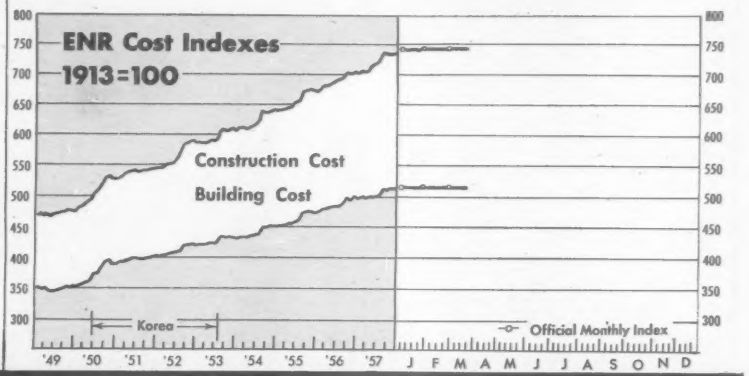
Contract Awards
Millions of Dollars



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Mar. 20 1958	% Change from Feb. 20 1958	% Change from Mar. 21 1957
Construction Cost	744.16	+0.05	+5.0
Building Cost	515.84	+0.004	+3.0

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.


ENR Cost Indexes
1913=100
Construction Cost
Building Cost
Korea
Official Monthly Index
'49 '50 '51 '52 '53 '54 '55 '56 '57 J F M A M J J A S O N D
Monthly by years
Weekly 1958

AMOUNT OF CONTRACTS LET

By Ownership	This Week*	Cum. 13 wks 1958 millions	Chge '57-'58 %
All Heavy Constr.	$441.2	$3,831.3	−16
Private	196.1	1,751.9	−18
Public	245.1	2,079.4	−16
State & Municipal	190.2	1,655.1	−3
Federal	54.9	424.3	−40
By Type of Work			
Public			
Waterworks	11.1	57.5	−34
Sewerage	16.1	145.0	+39
Bridges†	9.8	101.6	−41
Highways	87.9	619.2	−12
Earthwork, Waterways	20.0	166.4	−47
Buildings, Excl. Housing	56.9	570.4	+6
Housing	20.4	276.3	+54
Unclassified	22.9	142.9	−56
Private			
Mass Housing	90.6	628.4	−13
Commercial	59.6	471.1	+15
Industrial	40.4	535.9	−37
Unclassified	5.5	116.6	−27

* 6-day week.
† Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of Mar. 20	Cum. 12 wks 1958 millions	Chge '57-'58 %
Corporate Securities	$146.1	$1,372.7	−9
State and Municipal:			
All Except Housing	55.4	1,738.1	+36
Housing	0.3	1.2	−97
Federal Loans	1.4	47.2	+45
Federal Aid	...	....	...
Total Nonfederal	$203.2	$3,159.2	+11
Federal Appropriations:			
Projects in U. S.	...	$520.0	...
Outside U. S.	...	....	...
Total New Capital	$203.2	$3,679.2	+29

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	Feb. 1958 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$112,518	+0.5	+6.5
By Ownership—			
Private	47,590	+0.6	+6.9
State and Municipal	51,050	+0.7	+7.0
Federal	13,878	−0.8	+3.0
By Type of Work—			
Waterworks	2,425	−0.01	+8.1
Sewerage	3,418	+0.7	+5.1
Bridges	3,370	+0.2	+9.9
Highways	13,297	−0.2	+1.1
Earthwork, Waterways	12,292	+0.2	+8.5
Public Buildings	20,262	+0.4	+7.3
Industrial Buildings	16,734	+0.4	+3.7
Commercial Buildings	20,982	+1.3	+10.6
Unclassified, Private	9,873*	−0.4	+5.1
Unclassified, Public	9,864	+1.2	+6.6

* Includes Private Bridges, $89 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

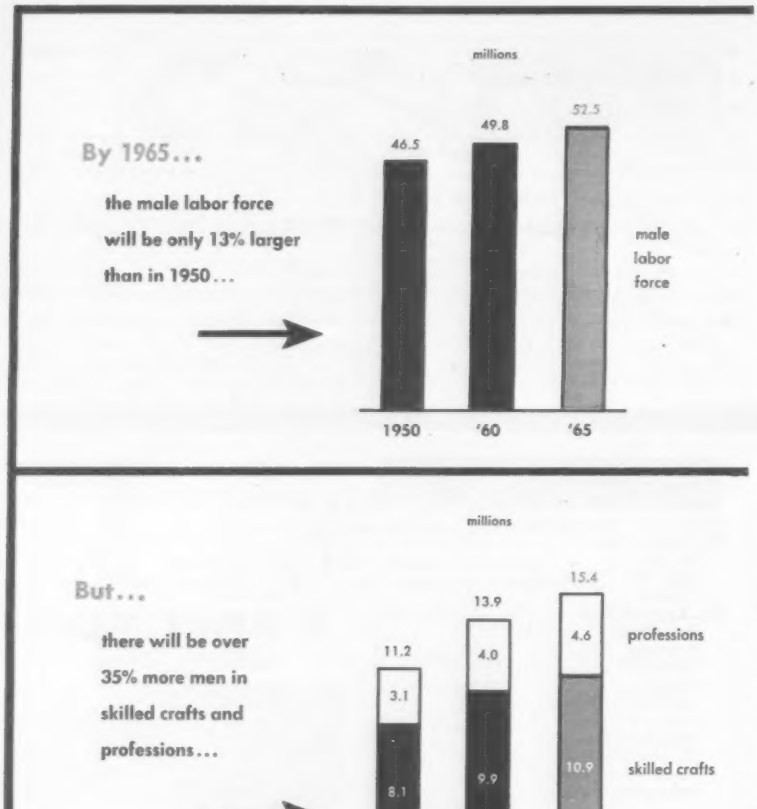
	1958 Feb.	1958 2-months (millions)	Percent Change from '57 Feb.	Year Cum.
Total U. S. (ENR reported)	$1,443	$3,021	−6.3	−26.7
By Ownership—				
Private	688	1,473	−21.6	−33.2
State and Municipal	698	1,409	+15.5	−21.8
Federal	57	139	−1.0	+19.4
By Type of Work—				
Waterworks	8	26	−65.2	−58.6
Sewerage	53	146	+24.3	+26.3
Bridges	39	101	+218.8	−36.4
Highways	76	353	−58.4	−54.4
Earthwork, Waterways	29	38	−33.9	−32.6
Public Buildings	371	610	+28.8	+2.2
Industrial Buildings	181	240	−38.5	−66.3
Commercial: Mass Housing	200	444	+10.5	−37.3
Other Building	285	739	−14.0	+29.5
Unclassified, Private	22	50	−68.8	−76.7
Unclassified, Public	179	274	+155.0	+79.4

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	592	1,364	−27.0	−16.9
By Ownership—				
Private	242	496	−39.0	−26.8
State and Municipal	268	715	−16.8	−3.9
Federal	82	153	−11.3	−30.4

THE LONGER LOOK:

Engineers, Skilled Labor S



Talk of shortages of engineers and skilled workers has subsided with the onset of an economic recession. But the long-run outlook remains one of accelerating demand for technical manpower to meet the growing needs of industry, government and consumers.

By 1965 the annual volume of construction put in place, for example, will be 40% higher than the 1957 total of $47.3 billion, according to estimates by the McGraw-Hill Department of Economics. This would represent a rise of 75%, in physical terms, over the volume of construction in 1950.

This rate of growth, which will be paralleled, or even exceeded in several other industries, will require greatly increased numbers of engineers, draftsmen, scientists and skilled workers. And this increase must come, as the chart shows, during a period when the total male labor force will be increasing only 13% over the 1950 figure.

There is a good chance, however, that the percent increase in skilled craftsmen will be three times this great and that the technical professions will grow almost six times as fast. In other words, by 1965 we may have 38% more men in skilled crafts and 75% more engineers, scientists and draftsmen than we had in 1950.

These estimates were developed by Prof. A. J. Jaffe, director of the manpower and population program of the Bureau of Applied Social Research, Columbia University. They are based on an analysis of current trends in population, college enrollment, and on entry of men into various occupations and professions between the last two census years, 1940 and 1950.

• **Engineer force larger**—If these projections prove to be correct, there will be about 800,000 engineers in 1960 and 940,000 in 1965, compared with only 533,700 in 1950 and fewer than 300,000 in 1940. Draftsmen will be increasing at just about the same rate, from 115,900 in 1950 to almost 170,000 in 1960 and over 200,000 in 1965. The number of men in some of the sciences will be more than twice as high in 1965 as in 1950.

Technical and scientific professions are getting new recruits at a much faster rate than medicine, dentistry, pharmacy and law, which will have, in total, only about 25% more men in 1965 than they had in 1950.

Supply to Rise Sharply

The supply of skilled craftsmen (including foremen) is not moving up as rapidly as the supply of engineers, but it is still rising faster than the male labor force as a whole. By 1965 there may be nearly 11,000,000 men in skilled crafts, compared with 8,074,300 in 1950.

• **Building tradesmen to increase**—Some of the building trades, however, are climbing at a faster clip. The number of electricians, for instance, is expected to be 57% higher and plumbers 55% higher by 1965 than in 1950, compared with the 38% increase estimated for the entire craftsman group.

The sharp increases in technical manpower during the coming several years will occur despite adverse trends in the male labor force as a whole. The young men entering the skilled trades and technical professions during the 1950s and early 1960s are, for the most part, members of the depression generation born in the 1930s.

In the age bracket 25-34, there will actually be 700,000 **fewer** men in 1965 than there were in 1955. The number in the 20-24 group—typical ages for skilled workers to finish apprenticeship or technical school training—will show a small rise, but the big jump will not come until after 1965.

Because of these adverse population trends in the age groups from which most new technical manpower must come, the growth estimated by A. J. Jaffe will not come automatically. For one thing, the economic incentives to go through long periods of training must be sustained. This means that wage and salary rates in technical jobs will have to rise, relative to occupations requiring less investment in training.

• **Educational facilities**—Also, there will have to be an expansion of educational facilities. The net numbers entering the technical fields in the early 1960s will be about one-third higher than the average for the 1950s. Expansion will be needed not only in engineering schools but also in facilities for training skilled workers.

Traditional apprenticeship programs do not cover all skilled occupations, and these may prove inadequate. There will have to be an increase in the capacity of technical schools and in the training programs of industry and government agencies.

Some increase in the over-all supply of workers in technical professions and skilled trades will come from greater participation of women in these fields. In 1950, for example, only 1.2% of the engineers and only 3% of all craftsmen were women.

Most of the increase, however, still must come from a stepping up of the proportion of young men going into technical occupations and professions. Because of population trends, it may be a close question whether enough will do so to assure an adequate supply of trained manpower when it is needed.

Perini, Ltd., Sues

American firm's subsidiary claims $4.3 million unpaid

Perini, Ltd., Toronto, Canadian subsidiary of Perini Corp., Framingham, Mass., will take into court claims totaling $4.3 million against two uranium mining firms. Perini, Ltd., alleges that the two mining companies owe that amount for work completed.

The writs were filed recently against Consolidated Denison Mines, Ltd., and Can-Met Explorations, Ltd., after negotiations for a settlement broke down. The mining firms have filed counterclaims against the subsidiary totaling $5.9 million, charging overpayment of that amount.

The case grew out of plants Perini constructed for the two companies in the Blind River area of northern Ontario. The plant for Consolidated Denison cost $18-20 million and the one for Can-Met, $9-10 million. The former went into production last June and all work was completed in January 1958. The Can-Met plant was in production last November, and work was finished at that time.

Differences over payment arose last summer. The mining firms asserted they had overpaid Perini, and the latter claimed it had not been fully paid according to its contract. Numerous meetings failed to settle the dispute, and Perini then decided to take court action under the Ontario Mechanics Lien Act.

Rumors then circulated in Toronto financial circles that, in filing suit, Perini was trying to take over Consolidated Denison. A. D. McKee, president of Perini, Ltd., also is a director of the

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mining company. When asked about the rumors, Mr. McKee told ENR that they were "entirely unfounded."

"We are staying in the business we know best," he continued. "Like any firm, we have surplus funds from time to time that we invest and from which we collect dividends, but we are positively not trying to take control of these properties."

Perini is asking $2.5 million from Consolidated Denison and $1.8 million from Can-Met. Consolidated's claim against Perini is for $4 million, and Can-Met's is for $1.9 million. No date has been set for the court hearings.

States Boost 1958 Road Outlays

Anticipated expenditure increases range from 11% for Oklahoma to 159% in Virginia and Idaho

Highway construction will get a sharp boost in at least 21 states, the District of Columbia, and Hawaii. Every state highway department replying so far to ENR's inquiry has reported increases in work expected this year. They range from the 159% rise over 1957 construction scheduled by Virginia and Idaho to the 11% increase planned by Oklahoma. Twelve of the states listed have more than $100 million worth of road work in various stages of planning. Only five report less work in planning than is scheduled for construction in 1958.

The $50 million scheduled means "by far the biggest construction year to date in Nebraska," according to engineer John W. Ossack.

Wisconsin has almost doubled its 1957 volume of construction scheduled for 1958, plus a giant $700 million in work on the drafting boards.

Idaho will put over $40 million of road jobs in contractors' hands this year, compared with the $15.4 million contracted in 1957.

Even Hawaii will come up with $16.8 million of ABC federal-aid roads this year against only $6 million last year. "This will be the first big year for construction under an accelerated highway program . . ." according to W. M. Wachter, Territorial highway engineer.

One hitch was mentioned by some states; announcement of 1959-60 allotments may be postponed by the federal government from August of this year to January 1959. This may force some states to set back their planning. As Illinois' chief highway engineer R. R. Bartelsmeyer said: "Unless additional federal apportionments are made as in the past, it will be necessary to defer a part of the 1958 estimated construction."

—Highway and Bridge Contracts Planned for 1958—

Reported to ENR by state highway departments

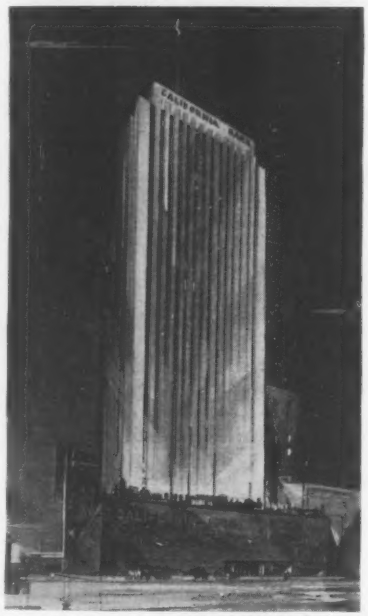
State	Actual 1957 (mil.)	Scheduled 1958 (mil.)	% Chg.	On Drawing Boards (mil.)
Texas	$223.6	$250.0	+ 12	$500
Michigan	170.0	200.0	+ 18	300
Illinois	137.6	197.2	+ 43	280
Virginia	52.8	136.5	+159	251
Iowa	93.6	136.1	+ 45	105
Missouri	76.6	100.2	+ 31	...
Florida	93.6	125.0	+ 34	400
Kentucky	43.1	94.0	+118	...
Georgia	66.9	90.0	+ 35	...
Minnesota	48.9	69.0	+ 41	170
Oklahoma	59.8	66.5	+ 11	190
Wisconsin	58	101	+ 74	700
Washington	45.9	65.9	+ 44	400
Connecticut	41.1	65	+ 58	150
Nebraska	34.4	50.3	+ 46	40
North Dakota	25.9	51.1	+ 97	50
Montana	23.0	47.0	+104	100
South Dakota	23.9	45.3	+ 90	30
Utah	19.6	41.0	+109	35–40
Idaho	15.4	40	+159	40
Nevada	13.6	32.4	+138	69
Dist. of Columbia	13.3	27.1	+104	60
Hawaii	6	16.8	+180	...

Builders May Boost Output Of Mid-Price Homes 20%

Construction of homes priced between $10,000 and $15,000 may rise as much as 20% this year, according to Harold P. Braman, managing director of the National Savings and Loan League.

Over the last two years, an average of 500,000 of these homes have been built annually, but "this year, we expect easing of mortgage credit conditions to result in construction of perhaps 600,000 middle-price dwellings.

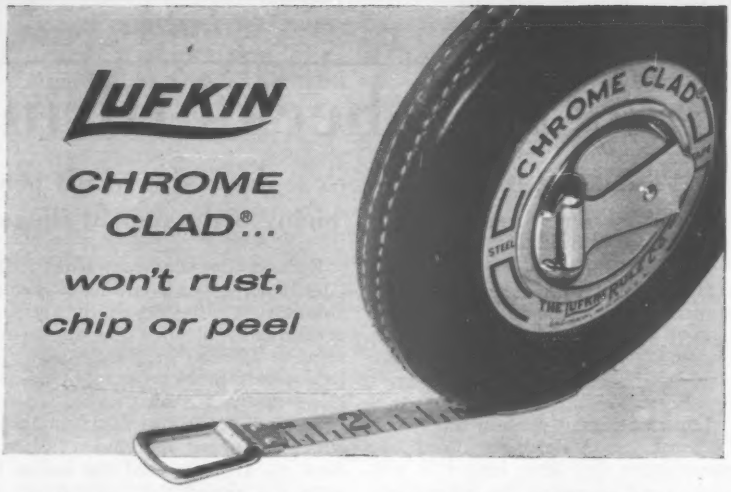
Mr. Braman said it was evident that this year "builders are making every effort to shave costs to meet this market demand. Mortgage lenders, too, are encouraging them to lighten up on the luxury items and concentrate on house value."



Ground Broken for Highest Building in Los Angeles

Ground was broken recently for California Bank's new headquarters building in Los Angeles. The 18 story building, having a height of 267 ft, is the first planned and started since the city repealed its 150 ft maximum height limit. The $8.5 million structure is scheduled for completion in the spring of 1960.

C. L. Beck Construction & Realty Co. is the general contractor. Brandow and Johnston (ENR Mar. 13, p. 73) are the structural engineers and Claud Beelman & Associates are the architects.



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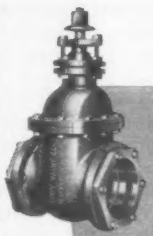

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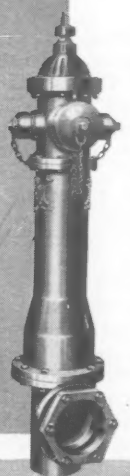

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Industry Checks Hiring Clauses

Unions and contractors seek to avoid stiff NLRB penalty where board finds a hiring arrangement illegal

The president of the electrical workers union (IBEW) has joined a rapidly growing list of union leaders and contractors who are urging immediate re-examination of labor contract clauses containing questionable union security provisions.

Cause of current concern is a recent National Labor Relations Board announcement that after June 1 it will apply a rule known as the Brown-Olds doctrine—in addition to cease and desist and back pay orders—whenever it finds a worker has been the victim of an illegal hiring practice (ENR Mar. 6, p. 141).

Under the Brown-Olds rule, unions and contractors participating in illegal hiring arrangements may be held jointly and severally liable for the return of all union dues, assessments, initiation and work permit fees collected by the union from workers during a period commencing six months before a complaint is filed.

Problem arises under Section 8 of the Taft-Hartley Act forbidding any discrimination against employees "in regard to hire or tenure of employment or any condition of employment" that encourages or discourages union membership. Only exception is authorized use, except in right-to-work law states, of a 30 day union shop clause.

• **Trend**—Following the NLRB announcement, both the Associated General Contractors of America and the AFL-CIO Building and Construction Trades Department took immediate steps to minimize the Brown-Olds threat, which many feel could bankrupt both unions and contractors. They repeated former and frequent warnings that labor contract clauses should conform to the law and advised their members or affiliates to scrutinize existing labor contracts and eliminate doubtful provisions.

Types of clauses within the orbit of the NLRB edict include those that permit employment of union members only or that otherwise effect a closed shop; that establish a preferential hiring hall arrangement; that call for union referral cards or work permits; that set up a union shop under conditions other than those permitted by law; or that otherwise unlawfully promote union security.

Richard Gray, President of the AFL-CIO Building and Construction Trades Department, has urged the general presidents of all unions in the department to acquaint their locals with the Brown-Olds problem and "to advise" them to bring their "union security provisions and practices into compliance with the law" if they haven't already done so. He has asked the unions to keep the department advised of all litigation under the Brown-Olds rule to enable the department's Legal Advisory Committee "to coordinate the litigation and to present the best possible case in the courts."

Aim of the unions is to obey the law insofar as they can interpret present rulings and to minimize the threat of the Brown-Olds remedy while they continue to fight the Taft-Hartley Act's union security provisions in the courts and legislatures.

Meanwhile, the National Constructors Association—one of whose members regards the issue as "loaded with dynamite"—is treating the problem as a legal one, with attorneys checking the validity of their hiring clauses and working out corrections where deemed necessary.

Some indication of what all this means in practical language has come from the AGC's North and Central California Chapters whose hiring arrangements with the ironworkers union have been questioned recently by the NLRB. They have issued this advice to their members:

"If any person applies for a job as an ironworker you must not refuse to employ such applicant:

"A) Because he does not have a dispatch slip from the union or a union permit or clearance.

"B) Because he does not present a membership card in the union or because he has not applied for membership in the union.

"C) For any other reason connected with membership or nonmembership in any union."

• **Criticism**—President of the plumbers union, Peter T. Schoemann, has called application of the Brown-Olds rule "a punitive and union busting order" that is the "most drastic" ever issued against a union by the NLRB or any court. Through this policy, he said the NLRB "could bankrupt and financially cripple many local unions, and for that matter, international unions as well who operate under national agreements."

Typical of current recommendations is one from IBEW President Gordon Freeman who has advised all IBEW affiliates to "commence negotiations with the employers who are parties" to union security agreements and correct them where necessary. He suggested use of specific union shop or maintenance of membership clauses considered safe by IBEW and said the Taft-Hartley Act language should be followed in states that do not have right-to-work laws, omitting all union security clauses in states with such laws.

Complicating the problem is the fact that the NLRB has indicated that even a nondiscriminatory hiring hall arrangement is illegal unless the labor contract sets up objective standards to assure lawful operation. But the decision explaining this is not expected until June.

In addition, application of the Brown-Olds rule on a union-wide instead of a project basis, on an association-wide rather than an employer basis, on an international rather than a local union basis, or as evidence of violation of the Copeland Anti-Kickback Act are considered by many to be disturbing possibilities.

Construction Costs

Cleveland homebuilders ask for a halt to wage boosts, featherbedding

In an effort to hold the line on construction labor costs, the Cleveland (Ohio) Home Builders Association has denied existence of any justification for new wage increases to building tradesmen and has condemned union work practices that are responsible, it has charged, for Cleveland building costs being among the highest in the nation.

It also has warned its members that closed shop agreements are illegal.

The association, however, has left the door open for negotiations over a reported union demand for a 25 cent hourly wage increase this year. Contracts of most of the AFL-CIO building trades unions expire May 1.

A stronger position against wage increases has been taken by the Cleveland Building Trades Employers Association, which has joined the homebuilders in their criticism of costly

union practices. William Hunkin, chairman of the BTEA negotiating committee, said two weeks ago that there will be no wage increases because "the national economy does not warrant it."

Mr. Hunkin called for an end to featherbedding practices and observed that the "unions' national officers are doing all they can" to stop them. (At a Miami meeting on February 5, the general presidents of the 18 AFL-CIO building trades unions adopted a statement of policy—commonly referred to as the Ten Commandments—aimed at elimination of wasteful work practices by local unions. President Gray has urged strict adherence to each point in the statement.)

The Cleveland homebuilders position was revealed in a report adopted by trustees authorized to deal as they saw fit with union wage demands. The report was read at a March 11 HBA meeting.

The report disclosed results of a survey conducted among Cleveland HBA members to determine (1) what trades contributed most to high building costs and (2) what practices have added to costs.

Survey returns, according to the report, particularly criticize plumbers, electricians and glaziers. The report states that survey replies accuse plumbers of late starting and early quitting times which result in "a demoralizing influence on other workmen," of refusal to handle certain types of prefabricated materials and of restrictions on use of materials and techniques "designed to lower costs."

The electrical workers union, the report continues, insists "on use of antiquated methods and materials in wiring," prohibits use of two-wire conduits that speed installation and permit "a saving of $100 per home," and "sets time to be consumed for installation of a job."

Glaziers are accused in survey replies of requiring "too much help to set plate glass and Thermopane," of limiting "the amount of work that can be done per day" and of restricting use of pre-glazed sash.

All the accusations contained in the report were denied by business agents of the local unions that were criticized.

On the issue of wage increases, the HBA report said: "Any wage increase is unwarranted . . . the main issue is to reduce costs to keep building costs at a level taxpayers and home buyers can afford for homes, schools, and public buildings, and to provide more work days for craftsmen."

OFFICIAL PROPOSALS

Bids: April 21, 1958.

Boro of Manasquan
County of Monmouth, New Jersey

Notice is hereby given that sealed bids will be received by the Mayor and Council of the Boro of Manasquan for the installation of a sewerage system and appurtenances and other work incidental thereto and opened and read in public at the Boro Hall, Manasquan, New Jersey on April 21, 1958 at 8 o'clock P.M.

Drawings, specifications, and form of bids, contract and Bond for the proposed work prepared by Otis R. Seaman, Boro Engineer, have been filed in the office of said Engineer at 485 Broadway, Long Branch, N. J., and may be inspected by prospective bidders during business hours. Bidders will be furnished with a copy of the drawings and specifications by the Engineer upon proper notice and payment of a deposit of twenty-five ($25.00) Dollars.

Bids must be made on the Standard Proposal Forms in the manner designated therein as required by the specifications; must be enclosed in sealed envelopes bearing the name and address of the bidder and name of work on the outside, addressed to the Mayor and Council, Boro of Manasquan and must be accompanied by a Bonding Certificate and a certified check drawn to the order of the Boro treasurer for not less than ten (10%) per cent of the amount bid, and be delivered at the place and on the hour above named. The Standard Proposal Forms will be furnished upon application to the Engineer.

The award of the contract for this work will not be made until necessary monies to do the work have been provided by the Borough in a lawful manner.

The Boro Engineer and the Mayor and Council reserve the right to require a complete financial and experience statement from prospective bidders before furnishing proposal forms or specifications, or before awarding contract in accordance with R.S. 40:50-5. The right is also reserved to reject any or all bids, or to waive any informalities, where such informality is not detrimental to the best interests of the Boro of Manasquan. The right is also reserved to increase or decrease the quantities specified.

By order of the Mayor and Council of the Boro of Manasquan, New Jersey.
E. DONALD OSBORN, Mayor
V. MILLER PRESTON, Clerk

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5031) will be received at Oak View, California until 10 a.m. Pacific Standard Time, May 6, 1958, for furnishing labor and materials for automatic control and telemetering system, Ventura River Project, California. Location near Oak View and Ojai, California. Principal items are furnishing and installing automatic control and telemetering system and constructing telephone line to Rincon Balancing Reservoir. Completion time 450 days. For particulars, address Bureau of Reclamation, P.O. Box 2511, Sacramento 11, California; P.O. Box 97, Oak View, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5032) will be received at Ogden, Utah, until 10 a.m. Mountain Standard Time, April 30, 1958, for furnishing labor and materials for earthwork (first stage) and extension of drainage in borrow area A, Willard Dam, Utah, Weber Basin Project. Location southwest of Willard, Utah. Principal items are 2,200,000 cu. yds. excavation; 2,200,000 cu. yds. embankment; 2,000 roller hours rolling embankment, Zone 1; and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, P. O. Box 360, Salt Lake City 10, Utah; P. O. Box 387, Ogden, Utah; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Bids: April 30, 1958.

U. S. Army Corps of Engineers
Construction

LOCATIONS

E. Harmon Air Force Base, Newfoundland, Canada Goose Air Base, Goose Bay, Labrador, Canada

1. E. Harmon Air Force Base Project:—Invitation for Bids ENG-30-347-58-7. Construction of family housing including outside utilities and site work for 200 housing units, etc. at E. HARMON AIR BASE FORCE BASE, Newfoundland, Canada.

   Estimated Cost—$5,000,000 to $7,000,000.

   SEALED BIDS:—In duplicate and plainly marked will be received in the office of DEFENCE CONSTRUCTION (1951) LIMITED, Tender Opening Room, No. 4 Temporary Building, 56 Lyon Street, Ottawa, Ontario, Canada, until 10:00 A.M. Eastern Daylight Saving Time, 30 April 1958.

   BID FORMS, DRAWINGS AND SPECIFICATIONS:—Bid forms, drawings and specifications may be obtained by bona fide bidders from the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y. A deposit of $25.00 per set of drawings and specifications will be required, limited to a maximum of three sets to any one bidder. The deposit is to be made payable to "Treasurer of the United States". The deposit is forfeited if the complete drawings and specifications are not returned in good order to the issuing office within 15 days after the opening of bids.

2. Goose Air Base Project:—Invitation for Bids ENG-30-347-58-8. SCHEDULE "A"—Construction of family housing including outside utilities and site work for 100 housing units, etc. at GOOSE AIR BASE, Goose Bay, Labrador, Canada.

   Estimated Cost—$2,500,000 to $4,000,000.

   SCHEDULE "B"—Operational facilities including two dining halls, airmen's club, electrical and heating plant facilities.

   Estimated Cost—$2,000,000 to $3,000,000.

   SEALED BIDS:—In duplicate and plainly marked will be received in the office of DEFENCE CONSTRUCTION (1951) LIMITED, Tender Opening Room, No. 4 Temporary Building, 56 Lyon Street, Ottawa, Ontario, Canada, until 10:00 A.M. Eastern Daylight Saving Time, 30 April 1958.

   BID FORMS, DRAWINGS AND SPECIFICATIONS:—Bid forms, drawings and specifications may be obtained by bona fide bidders from the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y. A deposit of $25.00 is required for each set of drawings and specifications for work described in SCHEDULE "A", and $25.00 for each set of drawings and specifications for work described in SCHEDULE "B". The deposit is to be made payable to "Treasurer of the United States". The deposit is forfeited if the complete drawings and specifications are not returned in good order to the issuing office within 15 days after the opening of bids.

INSPECTION OF DRAWINGS AND SPECIFICATIONS

Drawings and specifications of BOTH projects may be seen at the office of the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, N. Y.

ARRANGEMENTS FOR VISITS TO THE PROJECT SITES

Visits to BOTH project sites can be arranged through the District Engineer, U. S. Army Engineer District, Eastern Ocean, 346 Broadway, New York 13, New York.

OFFICIAL PROPOSALS

Bids: April 9, 1958

State of Rhode Island and Providence Plantations Department of Administration Division of Purchases

NOTICE TO ROAD AND BRIDGE CONTRACTORS

SEALED PROPOSALS enclosed in an envelope endorsed "Proposal for R.I. Contract 5801, F.A. Project No. I-03(10) for East Providence Expressway, and F-031(4) for East Shore Expressway in East Providence" and addressed to the State Purchasing Agent, Rhode Island Department of Administration, Division of Purchases, 125 State House, Providence 2, Rhode Island, will be received until 11:30 A.M. on the 9th day of April 1958, at which time they will be opened and read in public.

R. I. Contract No. 5801, R. I. Federal-Aid Project No. I-03(10) for East Providence Expressway, and F-031(4) for East Shore Expressway (Proposal No. 1 for East Providence Expressway and Proposal No. 2 for East Shore Expressway), County of Providence, East Providence, Rhode Island. Construction consists of East Providence Expressway starting on the east side of Washington Bridge and proceeding easterly beyond the Rhode Island and Massachusetts State Line, and the East Shore Expressway connects with East Providence Expressway and continues in a southerly direction to a future proposed expressway; including divided highways, steel stringer bridge widening No. 462, prestressed concrete girder bridge Nos. 463, 464, 465, 466, 470, 471, 472, 476 and 477, continuous girder concrete bridge No. 475, reinforced concrete rigid frame bridge Nos. 467, 468 and 469, temporary lanes, service roads, paving, walks, walls, piers, abutments, embankments, curbing, utilities, signs and signals, site clearance, excavations, drainage facilities, clearing and grubbing, principal drainage facility, and earthwork from Station 124+50 on Lanes "C" and "D" to approximately 115 feet beyond Runnins River, and all other appurtenant parts of the work.

Bids for the above work must be made on blanks furnished by the Department of Public Works, Division of Roads and Bridges. Plans, Specifications and Special Provisions may be examined at Room 125, State House, or Room 224 State Office Building, Providence, Rhode Island, on and after March 19, 1958, every week day except Saturdays, Sundays and holidays, between the hours of 8:30 A.M. and 4:30 P.M. Blanks for submitting Proposals may be obtained through the office of the State Purchasing Agent at Room 125, State House. A deposit of $300.00 shall be made for each set of contract documents which will be refunded if Plans and Specifications are returned in good condition within two weeks after the opening of bids.

A certified check or bid bond payable to the State of Rhode Island, or cash, in the amount of $200,000 for the East Providence Expressway and the East Shore Expressway must be furnished by each bidder. The Proposal Guaranties will be returned after the contracts have been executed, unless forfeited in accordance with the stipulations in the Proposals.

A performance bond of one hundred (100) percent of the contract prices with a satisfactory surety company will be required of each successful bidder. The Division of Purchases reserves the right to reject any or all bids.

FEDERAL REQUIRED CONTRACT PROVISIONS: The attention of prospective bidders is called to the fact that this project is to be bid upon and the contract executed under the rules and regulations for carrying out the provisions of the Federal-Aid Road Act, as amended and supplemented, and the Required Provisions — Federal-Aid Contracts, Interstate Highways (Act of 1956), dated August 30, 1957, PPM 40-4, Attachment 1, as amended and supplemented, as required by the U. S. Department of Commerce, Bureau of Public Roads.

WAGES OF LABOR ON INTERSTATE HIGHWAY PROJECTS: The prevailing rate of wages for laborers and mechanics employed by contractors or subcontractors on the initial construction of highway projects on the Interstate System, authorized under the Federal Highway Act of 1956 shall be paid wages at rates not less than those prevailing on the same type of work on similar construction in the immediate locality as determined by the United States Secretary of Labor in accordance with the act of August 30, 1935, known as the Davis-Bacon Act, under Decision No. S-10073, which is part of the contracts. Chapter 290 of the Rhode Island General Laws, 1938, as amended, requires that "the contractor to whom the contract is awarded and any subcontractor under him shall have ordinarily paid the prevailing rate of per diem wages and shall continue to pay the prevailing rate of per diem wages and the general prevailing rate for regular, holiday, overtime and other working conditions to all workmen needed to execute the contract or work". The schedule of prevailing wage rates of per diem wages in the locality in which the work is to be performed for each craft, mechanic, teamster, laborer or type of workman needed to execute the contract or work is on file in the office of the Rhode Island Department of Labor.

On State, City and Town projects Chapter 291 of the General Laws of 1938 as amended, requires that Rhode Island citizens be given preference in employment.

SUBLETTING OR ASSIGNING THE CONTRACTS: The attention of bidders is directed to the Standard Specifications and Special Provisions covering subletting or assigning the contracts.

DEPARTMENT OF ADMINISTRATION
DIVISION OF PURCHASES
By Joseph L. Byron
State Purchasing Agent

Bids: April 15, 1958

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF THE
115 KV SUBMARINE CABLE
INSTALLATION
SPECIFICATION NO. PA-6-45
CONTRACT NO. T9

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the complete installation of the 115 kv Submarine Cable Crossing between Cumberland Head, New York and Grand Isle, Vermont, until 1030 A.M. Eastern Standard Time on the 15th day of April 1958, at the Authority's office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are estimated:

Construction of 115 kv submarine cable terminals at Cumberland Head, New York and Grand Isle, Vermont, including complete installation of cable terminal equipment.

Complete installation of 36,000 feet of oil filled 115 kv submarine cable in four (4) lengths of approximately 9,000 feet each.

The work shall be completed on or before September 1, 1958.

Plans, Specifications and Proposal Forms for the work may be obtained only from the Power Authority of the State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of ten dollars ($10.00) for initial set of Contract Documents and Five Dollars ($5.00) for each additional set, no part of which will be refunded. Two sets must be returned with each bid. Plans, Specifications and Proposal Forms will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, for the inspection by prospective bidders.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 per cent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN,
General Manager

Bids: May 13, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF WORK SECTION
NO. 2 OF THE WATERWAYS IN
NIAGARA AND NIAGARA FALLS
NIAGARA COUNTY, NEW YORK
SPECIFICATIONS NO. PA-N-23005
NIAGARA CONTRACT NO. N 6

NOTICE TO CONTRACTORS:

The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of the Waterways Work Section No. 2 and appurtenant works, located in Niagara and Niagara Falls, Niagara County, New York, on May 13, 1958, at 10:30 A.M., E.D.S.T at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are as follows:

5,085,000 cu. yds.	Excavation, unclassified
395,000 lin. ft.	Drill holes for exploration and grouting
610,000 cu. yds.	Concrete
34,250 tons	Reinforcing steel

All work shall be completed on or before one thousand ninety-six (1096) calendar days after the date of receipt of Notice of Award.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at The Coliseum Tower, 18th Floor, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Fifty ($50.00) dollars per initial set of contract documents, and Twenty-five ($25.00) dollars per set for additional sets, no part of which shall be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum price bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
General Manager

Bids: May 20, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
for the
Construction of Work Section No. 3
of the Waterways
In
Lewiston and Niagara
Niagara County, New York
Specifications No. PA-N-23005
Niagara Contract No. N7

NOTICE TO CONTRACTORS:

The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the Construction of the Waterways Work Section No. 3 and appurtenant works, located in Lewiston and Niagara, Niagara County, New York, on May 20, 1958, at 10:30 A.M. E.D.S.T. at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are as follows:

4,595,000 cu. yds.	Excavation, unclassified
489,300 lin. ft.	Drill holes for exploration and grouting
446,000 cu. yds.	Concrete
22,500 tons	Reinforcing steel

All work shall be completed on or before one thousand ninety-six (1096) calendar days after the date of receipt of Notice of Award.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the Coliseum Tower, 18th Floor, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Fifty ($50.00) dollars per initial set of contract documents, and Twenty-five ($25.00) dollars per set for additional sets, no part of which shall be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum price bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

OFFICIAL PROPOSALS

Bids: April 3, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time, on the 3rd day of April 1958, by Henry A. Cohen, Director Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Livingston (Rte. 36)	FARC 58-9	Caledonia-Mt. Morris, Part 1, S.H. 5593 Project S-172(2)	1.32	Asphalt Concrete=1.30 Mi. Misc. Work=0.02 Mi.	$20,000 Plans $3	$371,000
Monroe	FIC 58-2	Interstate Route No. 590-2-6 (Rochester City-Eastern Expressway, Pts. 2 and 3) Project I-1107(6)	2.50 (3.43 Acc.)	9" Cement Concrete Pavt.=2.20 Mi.; Asphalt Concrete Pavt.=0.29 Mi.; Misc. Work=0.01 Mi. Including 3 H.G.S. and R.F.G.S. Comp. I-Beams, 1 @ 238'; 2 @ 159.4'; 4 H.G.S. Comp. I-Beams 154', 118', 164.2', 133.3'; 1 Ped. Overpass I-Beam 203.2'	$400,000 Plans $20	$7,309,000
Orleans (Rte. 104)	FARC 58-11	Gaines-Murray, Pt. 1, S.H. 8237; Gaines-Murray, Pt. 2, S.H. 5697. Project F-366(3)	7.24	Asphalt Concrete=7.19 Mi. Misc. Work=0.05 Mi.	$26,000 Plans $2	$470,000
Orleans (Rte. 237)	FARC 58-10	Clarendon-Holley (Clarendon-Genesee Co. Line, Pt. 1), S.H. 391. Project S-408(2)	0.26	Asphalt Concrete=0.22 Mi. Misc Work=0.04 Mi.	$2,700 Plans $2	$49,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Rockland (Rte. 59)	RC 58-12	Knapps Corners-Nyack, S.H. 5178	0.14	Asphalt Concrete=0.14 Mi.	$3,000 Plans $2	$53,000
Westchester (Rte. 127)	FARC 58-18	Lake St., Ridge St., and Harrison Ave., S.H. 1457 White Plains Town Line-Harrison, S.H. 780 Project S-468(1)	0.96	Asphalt Concrete=0.95 Mi. Misc. Work=0.01 Mi.	$24,000 Plans $2	$439,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street; Babylon, L. I., New York						
Nassau & Suffolk	NSP 58-2	Northern State Parkway	38.10	Fencing	$12,000 Plans $2	$219,000
	SAGSP 58-1	Sagtikos State Parkway				
	CAPSP 58-1	Captree State Parkway				
	SSP 58-2	Southern State Parkway				
	WSP 58-1	Wantagh State Parkway				

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: April 10, 1958.

Delaware River Port Authority of the Commonwealth of Pennsylvania and the State of New Jersey

Administration Building
Camden, New Jersey

BENJAMIN FRANKLIN and
WALT WHITMAN BRIDGES—
CONTRACT NO. 101

Sealed bids will be received for TRAFFIC LANES OPEN SIGNS for the Benjamin Franklin and Walt Whitman Bridges, known as Contract No. 101, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Benjamin Franklin Bridge Plaza, Camden, New Jersey, until 2:30 P.M., Eastern Standard Time, Thursday, April 10, 1958, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this contract, which may be obtained upon the deposit of $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken, within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $3,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place or business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor Materialman's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the Work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
EXECUTIVE DIRECTOR

Bids: May 1, 1958

Construction Contract for Structural Steel Lower Level of George Washington Bridge

ADVANCE NOTICE

March 27, 1958

The Port of New York Authority is planning to advertise for Proposals for the furnishing and installation of the structural steel for the lower level of the George Washington Bridge on or about May 1, 1958.

The contract involves construction of a lower deck below the existing deck of the George Washington Bridge and consists of the furnishing and installation of approximately 13,500 tons of structural steel together with minor related work.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

Bids: April 8, 1958

Contract PN-502.325

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
BUILDINGS 293, 294, 295 AND WHARF
LOAD TESTS ON EXISTING PILES

Sealed proposals for making load tests on existing piles and for extracting existing piles in the wharf on the northerly side near the inshore end of City Channel at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, April 8, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

New York, March 27, 1958

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

Bids: April 10, 1958.

Contract No. R11:1-101.1 Department of Forests and Waters Commonwealth of Pennsylvania Glendale Dam on Beaverdam Run Cambria County, Pennsylvania

Sealed proposals for constructing an earth dam and appurtenant structures for the above flood control and recreational project will be received at the office of The Secretary of Forests and Waters, Room 512, Education Building, Harrisburg, Pennsylvania, until 2:00 P.M., E.S.T., April 10, 1958, at which time said proposals will be publicly opened and read.

The principal items of work include:

Rolled Embankment	630,000 c.y.
Concrete	4,600 c.y.
Reinforcing Steel	420,000 lb.
Excavating, Stripping and Grubbing	162,000 c.y.
Filters	37,500 tons
Rock Facing, Riprap	25,700 c.y.
1¾" Diamond Drilling	10,000 l.f.

Each bidder must submit an experience record, bid deposit, and equipment statement.

Contract documents may be examined during office hours at the Division of Flood Control Office, Department of Forests and Waters, Room 465, Education Building, Harrisburg, Pennsylvania, and at the office of the Consulting Engineers, Gannett, Fleming, Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania. Contract documents will be furnished upon payment of forty dollars ($40.00) for each set, upon application to the Division of Flood Control, Department of Forests and Waters, Contract documents need not be returned and the payment WILL NOT be refunded.

MAURICE K. GODDARD
Secretary, Department of
Forests and Waters
Commonwealth of Pennsylvania

OFFICIAL PROPOSALS

Bids: April 24, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
for the
Construction of Work Section No. 4
of the Waterways and Reservoir
in
Lewiston
Niagara County, New York
Specification No. PA-N-23005
Niagara Contract No. N8

NOTICE TO CONTRACTORS:

The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the Construction of the Waterways and Reservoir Work Section No. 4 and appurtenant works, located in Lewiston, Niagara County, New York on April 24, 1958, at 10:30 A.M., Eastern Standard Time, at the Authority's office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are as follows:

10,400,000 tons concrete aggregate and filter material production
9,540,000 cu. yds. excavation, unclassified
7,800,000 cu. yds. unclassified fill in reservoir embankments
1,380 tons structural steel

All work shall be completed on or before one thousand ninety-six (1096) calendar days after the date of receipt of Notice of Award.

Plans, Specifications and Proposal forms for the work may be obtained from the Power Authority of the State of New York, at the Coliseum Tower, 18th floor, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of fifty ($50.00) dollars per initial set of Contract Documents, and tweny-five ($25.00) dollars per set for additional sets, no part of which shall be refunded. Plans, Specifications and Proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum price bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

Bids: April 8, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
for the
Construction of the Plattsburgh Area
Transmission Lines
Specification No. PA-6-35
Contract No. T6

NOTICE TO CONTRACTORS:

The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the complete installation of the Plattsburgh Area Transmission Lines near Plattsburgh, New York, until 10:30 A.M. Eastern Standard Time on the 8th day of April, 1958, at the Authority's office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are estimated:

Installation of 200 wood pole structures of various types, for 115 kv and 46 kv operation—poles, crossarms and braces furnished by the Authority.
Installation of 100,000 pounds steel tower structures—structural steel and accessories furnished by the Authority.
Stringing 24 miles of three phase transmission line conductors and overhead ground wire—conductors and overhead ground wires furnished by the Authority.

The work shall be completed on or before April 1, 1959.

Plans, Specifications and Proposal Forms for the work may be obtained only from the Power Authority of the State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of ten dollars ($10.00) for initial set of Contract Documents and Five Dollars ($5.00) for each additional set, no part of which will be refunded. Two sets must be returned with each bid. Plans, Specifications and Proposal Forms will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, for the inspection by prospective bidders.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

Bids: April 10, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 10th day of April 1958, by Henry A. Cohen, Director Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name
DISTRICT No. 10, M. E. Gould, District Engineer, 325 West Main Street, Babylon, L. I., New York.		
Queens	HHE 58-1	Horace Harding Expressway, Section 2, Contract 6 (Douglaston Pumping Station)

Miles	Type	Deposit	Estimated Cost of Work
–	Construction of Pumping Station Building and Improvement of Grounds	$20,000 Plans $3	$365,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: April 8, 1958

Commonwealth of Pennsylvania Department of Forests and Waters Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed bids will be received by the Secretary of Forests and Waters at Room 512, Education Building, Harrisburg, until 2:00 P.M., E.S.T., April 8, 1958 and will be publicly opened and read for Dredging, Bulkhead Construction, and Fill for Duquesne Pier, Port of Erie Development Project, Erie, Erie County, Pennsylvania.

Specifications, Drawings and Bid Forms may be obtained in the office of the Division of Flood Control, Department of Forests and Waters, Room 465, Education Building, Harrisburg, Pennsylvania, upon payment of $25.00 per set, which mony WILL NOT be refunded. Drawings and Specifications may be reviewed free of charge at the office of the Port Commission of the City of Erie, City Hall Annex, Erie, Pennsylvania, and at Parsons, Brinckeroff, Hall & Macdonald, Engineers, 51 Broadway, New York 6, New York.

Approximate quantities of principal construction items are as follows: 73,000 cubic yards of silt removal; 45,000 cubic yards of dredging of shale and its placement and fill; 650 lineal feet of steel sheet pile bulkhead construction; and 2,700 tons of rip-rap slope protection in place.

Each bid must be accompanied by a bid bond, or a certified depositor's bank check, or certified bank cashier's, or certified bank treasurer's check drawn to the order of the Commonwealth of Pennsylvania as a proposal guarantee in the amount of ten (10) percent of the total amount of bid. Checks of unsuccessful bidders will be returned as soon as practicable after opening of bids. A joint venture bid will not be considered and all proposals must be filled in, signed and executed.

The Commonwealth of Pennsylvania reserves the right to reject any or all bids and to waive technicalities in bids.

MAURICE K. GODDARD
Secretary of Forests
and Waters

Bids: May 6, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
for the
Construction of Work Section No. 1
of the Waterways
In
Niagara Falls
Niagara County, New York
Specifications No. PA-N-23005
Niagara Contract No. N5

NOTICE TO CONTRACTORS:

The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the Construction of the Waterways Work Section No. 1 and appurtenant works, located in Niagara Falls, Niagara County, New York, on May 6, 1958, at 10:30 A.M., E.D.S.T., at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are as follows:

7,350,000 cu. yds.	Excavation, unclassified
375,000 lin. ft.	Drill holes for anchor bars, exploration & grouting
673,000 cu. yds.	Concrete
37,750 tons	Reinforcing steel
93 tons	Miscellaneous metalwork
1,104 tons	Erection of structural steel
1,600 tons	Erection of gates, gate and stop log guides & hoists

All work shall be completed on or before one thousand ninety-six (1096) calendar days after the date of receipt of Notice of Award.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at The Coliseum Tower, 18th Floor, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Fifty ($50.00) dollars per initial set of contract documents, and Twenty-five ($25.00) dollars per set for additional sets, no part of which shall be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum price bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

OFFICIAL PROPOSALS

Bids: April 11, 1958

Contract O&M-436

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUILDING
RENOVATION OF 15th FLOOR
CORRIDOR

Sealed proposals for furnishing all labor, material and equipment for renovating the 15th Floor corridor of the Port Authority Building, 111 Eighth Avenue, New York 11, New York, will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A.M., Friday, April 11, 1958, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, March 27, 1958

Bids: April 4th, 1958.

Board of Education
Bureau of Construction

Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT
The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:
General Construction, Plumbing and Drainage, Heating and Ventilating, Electrical Work and Lighting Fixtures for the new Public School 297, Brooklyn, Park Ave., Floyd St., and Tompkins Avenue.
Prequalification application forms will have to be secured from and must be submitted to the Sunperintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y.
Bids when advertised, will be received from prequalified bidders only.
Time for submitting prequalification applications by contractors will expire on Friday, April 4, 1958.

WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
Dated: March 20, 1958.

Bids: April 17, 1958.

Contract O&M-466

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
PAVING AND FENCING AT CAA
BUILDING (HANGAR II)

Sealed proposals for furnishing all labor, material and equipment for paving, fencing and related construction at the CAA Building (Hangar II) at New York International Airport will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11 A.M., Thursday April 17, 1958, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, March 27, 1958

OFFICIAL PROPOSALS

Bids: April 18, 1958.

Department of Forests and Waters
Commonwealth of Pennsylvania

CONEWAGO DAM ON BEAVER CREEK
York County, Pennsylvania
CONTRACT NO. R 67:1-101.1

Sealed bids for constructing an earth dam will be received at the office of the Secretary of Forests and Waters, Room 512, Education Building, Harrisburg, Pennsylvania, until 2:00 P.M., E.S.T., April 18, 1958, at which time said bids will be publicly opened and read in Room 200, Education Building. The principal items of work include:

Rock Excavation	30,920 c.y.
Rock embankment	27,000 c.y.
Earth embankment	74,000 c.y.
Concrete	1,944 c.y.
Reinforcing steel	131,245 lb.
Excavation & Stripping	29,890 c.y.
Filters	3,040 c.y.
Core drilling	5,700 l.f.

Each bidder must submit an experience record, bid deposit, and equipment statement.
Contract documents may be examined free-of-charge or obtained from the Division of Flood Control, Department of Forests and Waters, Room 465, Education Building, Harrisburg, Pennsylvania, upon payment of twenty dollars ($20.00) for each set, which payment WILL NOT be refunded.

MAURICE K. GODDARD
Secretary, Department of
Forests and Waters
Commonwealth of Pennsylvania

OFFICIAL PROPOSALS

Bids: April 15, 1958

Contract O&M-469

THE PORT OF NEW YORK AUTHORITY
NEW YORK UNION MOTOR TRUCK
TERMINAL

REPAIRS TO PARAPET WALL COPING

Sealed proposals for furnishing all labor, material and equipment for repairs to the parapet wall coping of the New York Union Motor Truck Terminal at 325 Spring Street, New York, New York, will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11 A.M., Tuesday, April 15, 1958, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, March 27, 1958

EMPLOYMENT OPPORTUNITIES

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div of this publication.
Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Construction Superintendent for bridges etc. Steady employment to qualified man, Dakota location. Please reply P-7429, Engineering News-Record.

Traffic Engineer to head county traffic engineering staff. CE with grad work traffic. Min 1 yr exp respn chge traffic engr. Duties traffic studies, plans for signals, signs etc. Formal app sent to those who qualify. Mail brief resume to P-7436, Engineering News-Record.

Paving Supt. wanted for Highway Work in South Eastern Penna. State fully experience, type of paving, etc. P-7531, Engineering News-Record.

Equipment Superintendent—Position open for Equipment superintendent to take complete supervisory charge of maintaining equipment for General Contractor in Eastern Pennsylvania. Permanent position. State previous experience and availability. Reply to P-7442, Engineering News-Record.

A growing architectural-engineering and building firm has an opening for mechanical-electrical engineer. Must have had experience in design and supervision of mechanical and electrical equipment for industrial building and processing. Permanent position—excellent working conditions. Reply with complete resume—P.O. Box 349, Princeton, New Jersey.

Chief Civil Engineer—Highways. Extensive administrative experience, modern highway design, either former state highway or consulting engineering experience acceptable. Salary high. Bonus incentive. P-7453, Engineering News-Record.

6—Concrete, asphalt, soils Engineer, Technicians and inspectors for immediate long term in Mid-western states. Salary range dependent upon experience and education. For consideration, send resume, snapshot, salary requirements and date available to Testing Service Corporation, P. O. Box 231, Villa Park, Illinois.

POSITIONS VACANT

Redevelopment project planning experience, plus a degree in city planning, architecture, landscape architecture, civil engineering, economics or sociology. Experience in the Federal urban renewal program is essential. Position: Planner LV. Salary: $6678 per annum. Apply: James F. Reynolds, Executive Director, Providence Redevelopment Agency, City Hall, Providence 3, Rhode Island.

Assistant to Contractor with some engineer-ing ability and varied experience in Heavy Construction. Growing concern located in Southern Connecticut. Resume and Salary required to P-7529, Engineering News-Record.

Sales Engineer to introduce outstanding prod-uct in sanitary and water supply fields. Young, aggressive, well-financed company. Salary open. Location: Southeast. P-7437, Engineering News-Record.

Chief Engineer: City of Middletown, Ohio, invites applications. Registration as a professionel engineer in State of Ohio, required. Salary starting $7820.80 per year with increase after six months and each year thereafter for next three years to final salary of $9360.00 per year. Also fringe benefits. Contact Director of Public Service, P.O. Box 530, Middletown, Ohio.

Civil Engineer: City of Middletown, Ohio, in-vites applications. Registration as a professional Engineer in the State of Ohio required. Salary starting $6843.20 per year with increase after six months and each year thereafter for next three years to final salary of $8132.80 per year. Also fringe benefits. Contact Director of Public Service, P.O. Box 530, Middletown, Ohio.

Superintendent—Complete knowledge of road construction and bituminous paving. Must be able to estimate and take charge of complete road job. Year around position with reliable construction company in central New York. P-7538, Engineering News Record.

Wanted—Construction Superintendent and Foreman. Must be experienced on reinforced concrete and pipe lines in Sewerage Construction. Please send resume including education, work history and salary. Requirements sent to P-7450, Engineering News-Record.

(Continued on the following page)

EMPLOYMENT OPPORTUNITIES

DISPLAYED

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

—RATES—

UNDISPLAYED

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box Numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36, N. Y. April 10th issue closes March 31st.

POSITIONS VACANT

(Continued from preceding page)

Milwaukee, Wisconsin—Assistant Expressway Engineer—$9609.96 to $11,540.52 per yr. Vacancy in Expressway Division, Milw. County Dept. of Public Works. CE grad & elig for registrn as prof engr in State of Wis; 8 yrs exper in municipal projects incl 4 in responsible supvsry or admin capcty. Sound annuity & pension system incl social security. Completed application to be on file before 4 PM Fri, April 18, 1958. Apply: Milwaukee County Civil Service Commission, Room 206, Courthouse, Milwaukee 3, Wis.

General Contractor wants man experienced in estimating, bidding, and supervising construction in sewer work, sewage treatment plants, bridges and other related items. This is new department. Location Ohio and adjacent areas. All replies should state complete information regarding education, experience, previous employers, and salary expected. P-7566, Engineering News-Record.

Wanted: Civil Engineer or Geologist, single, under thirty, to handle soil borings and aggregate investigations throughout U. S. Salary $125,000 per week plus travel expenses. Western Contracting Corporation, Sioux City, Iowa.

Engineer Estimator: At Present in Detroit, Michigan area but must be willing to relocate if necessary. Must have quantity survey and construction experience. Opportunity for permanent employment and advancement. P-7609, Engineering News-Record.

Field Engineer and Surveyor wanted to supervise and direct bridge construction in Columbus, Ohio area. Must be Registered. P-7608, Engineering News-Record.

Wanted—Competent engineers and draftsmen for work to produce plans for filtration plants and/or sewage treatment plants. Advise when can report, state age, experience, salary expected. P-7607, Engineering News-Record.

Hydraulic Engineer. Graduate hydraulic engineer, 30-40, with five or more years in flood control. Will assist in the preparation of technical literature on dams, flood control, culvert and drainage structures. Position involves inspection of projects under construction and assistance to field forces in promoting concrete. Must have good personality and ability to write and speak in public. Salary open. Location, Chicago. P-7596, Engineering News-Record.

Design Engineer for a progressive company employing 125 in Central Florida. Design & standardization of aggregate bins, Silos, and conveying systems for concrete Redi-Mix plants & allied fields. 3 to 5 years direct experience in this field required. Replies should include complete resume & salary expected. P-7611, Engineering News-Record.

Sales Engineer for steel products. Excellent territories with headquarters in the Cincinnati Ohio area. Must be college graduate or equivalent sales experience. Salary plus commission. Will require extensive travel. Replies should include complete resume. P-7612, Engineering News-Record.

Experienced miscellaneous and ornamental iron estimator or detailer to take complete charge of drafting department, including all purchasing and expediting. Please give complete resume of experience, age, and salary expected in first reply. P-7613, Engineering News-Record.

POSITIONS WANTED

Consulting Civil Engineer, office in South Florida desires to represent national engineering firm in Florida and Caribbean area. PW-7422, Engineering News-Record.

(Continued on opposite page)

COMMONWEALTH OF AUSTRALIA

THE SNOWY MOUNTAINS HYDRO-ELECTRIC AUTHORITY

INVITES APPLICATIONS for the position of

CHIEF CIVIL ENGINEER

Salary—£3,800 (Australian)

Applicants must possess recognized professional qualifications and have wide experience in the investigation, design, and construction of major civil engineering works.

The Chief Civil Engineer is directly responsible to the Authority for the management and conduct of the Authority's civil engineering activities, including the co-ordination and integration of the work of the Civil Design Division, the Major Contracts Division, and the Scientific Services Division.

Only those with successful experience in high executive positions and with proven engineering and administrative ability will be considered.

Information on superannuation, leave and other conditions of service is available on application to Liaison Officer, Snowy Mountains Hydro-Electric Authority, c/o U.S. Bureau of Reclamation, Federal Center, Bldg. 53, Denver 2, Colorado.

Headquarters of the Authority is at Cooma, New South Wales, where housing on a rental basis will be available for the successful applicant on taking up duty.

Applications, stating name, age, marital status, present position and salary, together with full and detailed particulars of past experience, should be addressed to the Business Manager, Snowy Mountains Hydro-Electric Authority, Post Office Box 332, Cooma North, N.S.W., Australia. Applications close on 18th April, 1958.

Field Engineers, Estimators Building Construction

Northern New York construction firm offers long range opportunities to civil engineers up to age 40 with experience in building construction for positions in estimating or field layout work.

John W. Rouse Construction Corporation
8 Church Street, Gouverneur, New York

ROAD CONSTRUCTION ENGINEER

Asphalt

Graduate engineer with minimum 7 years experience in road construction using liquid asphalt. Some knowledge of manufacturing helpful. To serve as technical advisor to company, government, road contractors and builders in Saudi Arabia.

High salary plus liberal all-inclusive benefits conducive to large savings. Excellent community facilities.

Write outlining background and experience. Please include telephone number.

Recruiting Supervisor Box 213

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

SUPERINTENDENT

General Contractor will add to expanding organization man qualified for large projects run independently of main office. Should be thoroughly experienced in both field supervision and estimating to handle smaller jobs, as is sometimes necessary, with minimum of field help. Man wanted is not the "Project Manager" type, but one not afraid of the hard work required to meet costs on lump sum contracts. Well paid and continuous employment. Work generally in Eastern half of this country. Give full resume in reply, particularly records of cost and schedule compliance.

Blount Brothers Construction Company
P. O. Box 949 Montgomery, Alabama

SALESMAN

New Jersey Mfg. Co. selling directly to HEAVY CONSTRUCTION CONTRACTORS requires SALESMAN experienced in MILL SUPPLY and HEAVY HARDWARE including FASTENERS (Bolts, Spikes, Tie Rods).

This position offers an unusual opportunity for advancement. A-1 references required.

Write all details—age, experience, family status, availability and recent earnings.

All replies will be kept in strict confidence.

SW-7564, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

When Answering
BOX NUMBERS . . .

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

POSITIONS WANTED
(Continued from opposite page)

Equipment Superintendent-Master Mechanic experienced in the supervision of all phases of shop management, repairing, maintenance and operation of large fleets of earth moving equipment, paving spreads, erection of asphalt or concrete plants. Presently nearing completion of contract in middle East Country, best of references, resume on request. PW-7428, Engineering News-Record.

Cost Engineer—Civil, Architectural. Experienced construction cost all types of heavy and light structure. Desires full time or short term connection as cost consultant with Arch-Eng'r construction firm, Multi; plant owners, foreign, domestic assignments. PW-7451, Engineering News-Record.

Graduate Structural Engineer (English). Sound knowledge of reinforced concrete-construction, detailing, design and estimating. Experience on buildings, bridges, airfield pavements and associated facilities. Present position 4 years in Nth. Canada with U.S. Government. Desires to relocate due forthcoming marriage. Field or office position. Versatile and conscientious. PW-7508, Engineering News-Record.

Civil & Structural Engineer, 35, European background, German degree, 6 years U.S. experience in design of ind'l bldgs. U.S. citizen. Languages: English, German, Serbo-Croat, French. Desires position abroad. PW-7498, Engineering News-Record.

BSEE MIT PE NY 15 years exp. bldg & airport design & construction, electronics maintenance seeks connection involving occasional travel or assignment overseas, pref. Far East. PW-7563, Engineering News-Record.

Teaching position desired. Age 31, P.E., M.S. in San Engr. Exp: design of several sewage treat. plants (incl. $6 million plant under constr.); university instructor; highway engineering. PW-7551, Engineering News-Record.

Overseas:—Superintendent — General Foreman—earthmoving, heavy foundations and superstructure, piling, caissons, general construction. 41 years old. PW-7560, Engineering News-Record.

Second year engineering student, 24, seeks job as junior engineer for summer in mining operation preferably. Very good math and geology. Military service finished, single. Go anywhere. Jack Kendall, Sierra College, Auburn, Calif.

Engineer-Attorney, 34, BS Civil Eng., LLB Ala., over 8 yrs. experience with trial exp. on claims and appeals with Corps of Eng., Commercial Pilot, Desire executive position with Engineering or Const. firm. PW-7599, Engineering News-Record.

Construction Superintendent 30 years in charge of work. Well experienced on turnpikes, expressways, multi bridge projects, excavation, payments. Specialist hurry up jobs and taking over behind schedule operations. PW-7610, Engineering News-Record.

Roads — Sewers — Pumping Stations — Consulting—Construction Supervision — Inspections. Free lance with more than 30 years experience. Will accept small or large assignments after June 1, 1958. George Kling—Phone Mu. 6-4848, Union, N. J.

Civil Engineer for technical sales. Young, Dutch-trained, seven years experience in heavy pre-fabricated and pre-stressed concrete construction, manufacture, estimation. PW-7593, Engineering News-Record.

Civil Engineer. Top record of 19 yrs. experience, heavy construction, municipal, and other, with some office. 2 yrs. college. Now resident engineer on sewage treatment plant and available on completion, July. PW-7603, Engineering News-Record.

Accountant Office manager experienced heavy construction Roads, Dams, Airfields, Water Lines, underground fuel systems, Industrial capable of saving any Contractor more than $10,000, in taxes a year. Age 48, go anywhere. Make your offer. Available April 21st. PW-7569, Engineering News-Record.

WORK WANTED

Structural Designers P.E.'s, contract or per diem, your office or ours, N.Y.C. WW-7390, Engineering News-Record.

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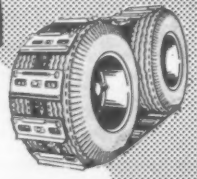

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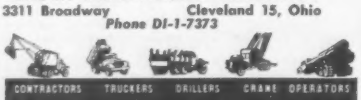

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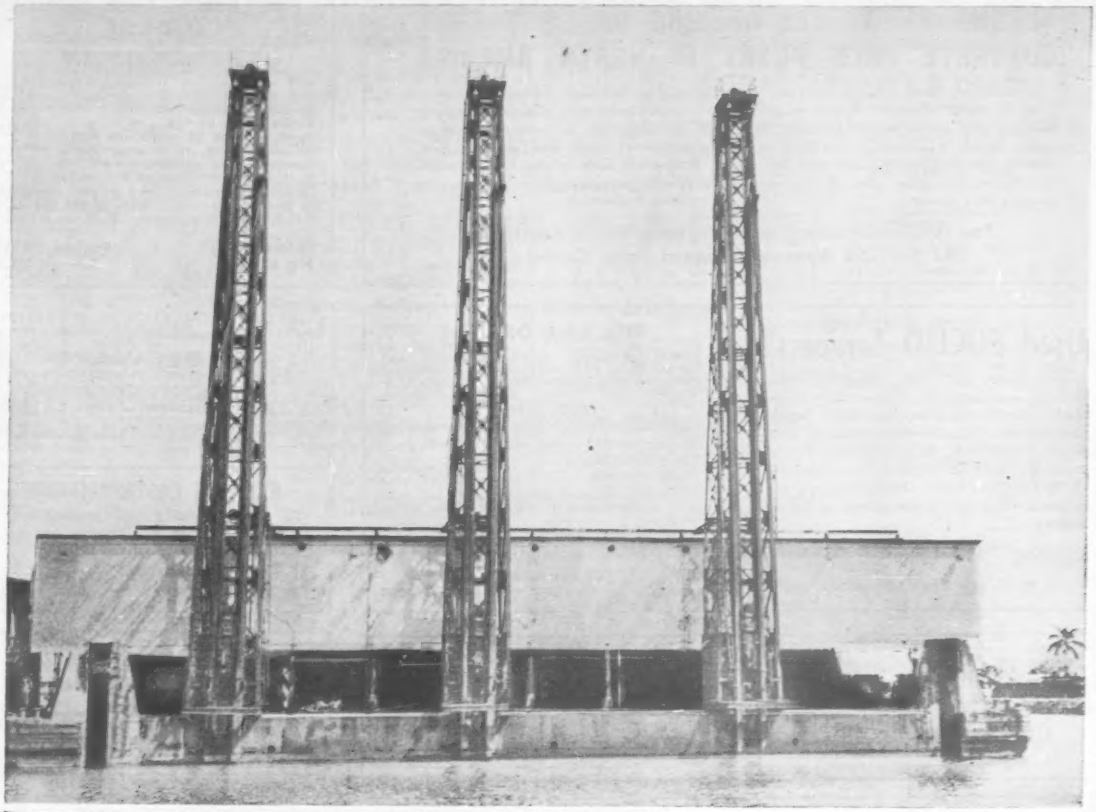

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Extending the Capitol

THE PROPOSED RECONSTRUCTION of the east front of the U.S. Capitol is meeting with vigorous opposition, despite its authorship by eminent architects in accordance with designs that carry logic and carefully guard the appearance of the famous structure. Equally vigorous support for the reconstruction is justified when facts are substituted for emotion.

Present legislation provides for extending the central portion of the Capitol between the Senate and House wings a distance of 32 ft 6 in. eastward, in substantial accordance with Scheme B of the architectural plan reported to Congress March 3, 1905. Both the new east front and the present west facade would be faced with marble (ENR Oct. 10, 1957, p. 23).

To block the reconstruction, a bill, S. 2883, has been introduced in the Senate to strike from the existing legislation the requirement that extension of the Capitol be in accord with Scheme B. And arguments are being made that changes in the east front would amount to desecration of a historic and architectural masterpiece. But would they? The facts suggest the contrary.

To begin with, according to Senator Pat McNamara, subcommittee chairman of last month's hearings on S. 2883: "The present form of the U.S. Capitol is the result of a series of successive additions over a long period of time, carried out under the direction of various architects of the Capitol, each of whom added to and, to some extent, modified the work of his predecessor. The last important alteration in the design of the building was the construction of the north and south wings and the dome, which was carried out between 1851 and 1865 from designs by Thomas U. Walter, who was architect of the Capitol during this period.

"The extension of the central portion of the Capitol eastward, to complete the effect intended when the wings and dome were built, has been under consideration since 1863, and has been recommended by every architect of the Capitol and every consulting architect who studied and reported upon the problem since that time."

Senator McNamara again pointed out, as others have, that the dome now rests on an octagonal base that overhangs the east wall some 15 ft, and that it was not intended that this condition should be permanent. And he subscribes to the view that the building in its present state represents an unfinished stage in the development of what was intended to be "a complete and harmonious design, and presents, in this overhang of the dome over the wall below, what the various architects of the Capitol and the consulting architects have considered a serious architectural defect."

In approving Scheme B, Congress obviously intended not only to obtain needed space, but also to correct this defect. Furthermore, the reconstruction in marble will preserve for posterity the beautiful architectural detail of the original design, whereas the present sandstone facade is badly deteriorated and is considered by some authorities to be dangerous. Since 1819, the sandstone has been painted repeatedly. Today, 35 coats of paint obscure the fine detail, yet the stone continues to deteriorate.

Proposals have been advanced that extensions be made to the west rather than to the east. However, J. George Stewart, present architect of the Capitol, states, "There is strong evidence that the ultimate needs of Congress can be met only through extensions to both the east and the west."

The record shows that most of the architects who have done monumental work in Washington advocated the extension. The associate architects retained for the project favor it. So do the members of the advisory board of consultants. It is noteworthy that these two groups of architects were appointed with the approval of the AIA and the Fine Arts Commission of the nation's capital city.

In short, the facts indicate that numerous changes have been made in the Capitol from shortly after its construction began in 1793 until the present. If objective studies indicate the extension of the east front is desirable, the change would be no more desecration than any of the previous changes. Actually, expert opinion appears to be that the extension called for by existing legislation will be a long-sought improvement and will in no way desecrate the building.

Recession Remedies

THE PRESIDENT is right in his stand not to be panicked into extreme governmental measures to combat a recession that may soon be arrested by temporarily latent factors of strength in the economy. What the federal government can do is to promote action on some of its existing programs, which have dragged for one reason or another.

The housing bill passed last week, paving the way for lending institutions to sell their mortgages to FNMA and thus to secure more funds to lend, focused on one of these lagging programs. The President's order to speed up civil works and military facility contracts hits at the same problem. His exhortations to urban redevelopment boards, public housing authorities and college housing committees to get busy and let contracts with federal aid already granted them are in the same pattern.

More in this same vein is warranted as a logical prelude to whatever else may be necessary. In the meantime, as stated on this page last week, both the federal and local governments should institute public works planning on a scale to serve the nation's growing needs regardless of recession considerations.